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Accounting information and the underpricing of Indonesian initial public offerings

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ACCOUNTING INFORMATION AND THE UNDERPRICING OF INDONESIAN INITIAL PUBLIC OFFERINGS

A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of

Doctor of Philosophy

at the Faculty of Business - Edith Cowan University

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USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

ABSTRACT

The purpose of this study is to examine the relation between accounting measures of total firm risk and the magnitudes of IPO initial returns. The existing explanations of the underpricing of IPO's suggests that the extent of underpricing is positively related to ex ante uncertainty about the issues. This study argues that accounting risk measures are related to the ex ante uncertainty. Since ex ante uncertainty is positively related to IPO underpricing, accounting risk measures are also arguably related to IPO underpricing. An event methodology is employed in this study.

Five accounting risk measures are examined: financial leverage, operating leverage, firm size, firm growth, and profitability. The model is tested using a sample of 149 Indonesian IPOs that went public during the period of 1989-1997. Three accounting measures of total risk: financial leverage, size, and firm growth, are found to be consistently related to the degree of underpricing. Financial leverage, measured as the ratio of total debt to total assets plus the market value of the issue in the first day, is positively and significantly associated with the degree of underpricing. A negative and significant association is found between firm size, measured as the size of the issue, and the degree of underpricing. In contrast to my expectations, growth is negatively related to the degree of underpricing. The coefficients of the other two accounting risk measures: operating leverage and profitability, are mixed. Overall, the results allow rejection of the null hypothesis that accounting measures of total firm risk are not related to the degree of underpricing.

Consistent with previous studies, this study finds that the portion of shares retained by the initial owners and the state of the market are significantly related to the extent of underpricing. Other findings reveal that underpricing is positively related to aftermarket standard deviation of return and is negatively related to the IPO's number of years in operation and the quality of underwriter. Further investigation suggests that the model fits better in the situation where more firms are making IPOs (hot periods). Tests on the pricing of IPOs provide additional evidence that the IPOs' accounting information is value relevant to the market price of the IPO. In particular, the IPOs' accounting information explains a large part of the variation of the offering price and first week market price.

Two important implications pertaining to the findings of this study are identified. Firstly, the study has provided further evidence that the degree of underpricing is positively related to the ex ante uncertainty about the aftermarket price of the issue. Secondly, the results give additional support to the proposition that accounting information is value relevant to the pricing of IPOs.

DECLARATION

"I certify that this thesis does not incorporate, without acknowledgment, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

Date: February 2000

Tatang Gumanti

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CHAPTER 1

INTRODUCTION

Going public through selling equity securities to the stock market for the first time, known as an initial public offering (IPO), is considered an important method for private companies to raise capital. The important functions of an IPO in providing additional finance to companies were shown by a massive growth of the number of companies making IPOs in Indonesian stock market, particularly, since the last market deregulation introduced in late 1988 and early 1989. The number of firms listed on the market has risen 26-fold during 1981-1994, from only eight firms in 1981 to 217 firms in 1994, which has made it the fastest growing emerging market in the world (Jenkinson & Ljungqvist, 1996). The funds raised in the new issues market were in excess of Rp. 14 trillion during the period. By the end of 1998 the number of firms listed in the stock market stood at 288 with market capitalisation of Rp. 176 trillion.

One aspect of IPOs that is of interest is that the offering prices have to be set without the benefit of an observable market price. The issuers and underwriters must set the offering price using non-price information since there are no adequate and reliable market price determinants for IPOs until trading of the securities begins. This makes the setting of the offering price difficult and critical because it will affect either the response of the market or the issuers' wealth (Ibbotson, Sindelar, & Ritter, 1988, 1994). Thus, uncertainty concerning the true value of IPO stocks is greater than that pertaining to already traded ones.

One source of information relevant to pricing an IPO is accounting information. Accounting information plays an important role in determining the price of an IPO given only limited, if any, information available about the issuing firm prior to the listing date. It is common that prior to the offering a company, as a privately held corporation, has less or even no obligation to reveal its information to the public. The literature has also recommended the incorporation of accounting numbers in determining at what price the stock of an IPO should be sold (Perez, 1984; Bloch, 1986; Sutton & Benedetto, 1988; Buck, 1990). In addition, accounting numbers have been used as a standard practice in many IPO valuation case studies (See for example Varaiya, Bergmark, & Taylor, 1997). Rosenberg and Marathe, cited in Downes and Heinkel (1982), suggest that the characteristics of a firm's risk and return are affected by its attributes, which could be in terms of indices (e.g., firm's industry group and size) or signals (e.g., the level of share ownership and the auditing firms). These attributes can be used to predict the risk and value of a firm's equity. As accounting information represents one of the attributes, it can also be of potential use as a predictor of risk and value and serve to reduce the uncertainty of a firm's security.

Analytical and empirical evidence of the association between accounting numbers and the value of IPOs are provided in numerous papers, for example, Downes and Heinkel (1982), Hughes (1986), Titman and Trueman (1986), Krinsky and Rotenberg (1989a, 1989b), Kim, Krinsky, and Lee. (1993, 1994, 1995a), and Klein (1996), amongst others. Kim et al. (1995a) and Klein, in particular, show that information in the prospectus is value relevant concerning the IPO. The value of IPOs is also related to the signals taken by the entrepreneurs, such as the level of ownership retention or the quality

of underwriters and auditors. These suggest that, despite the uncertainty surrounding the IPO, the value of an IPO is somewhat predictable.

Theoretical and empirical evidence has indicated that certain accounting measures can be used as proxies for total firm risk, that is, they could determine the riskiness of a corporation (Lev, 1974; Bowman, 1979; DeAngelo, 1990, among others). The literature also suggests that accounting information is relevant in determining the value and thus the riskiness of a corporation through the use of accounting analysis (Brealy & Myers, 1996; Benninga & Sarig, 1997; White, Sondhi, & Fried, 1998, among others). Since most of the information available in the prospectus is accounting information, it is arguable that this information represents a potential source for assessing the issuing firm. Some scholars have also advocated the possibility of using accounting information in assessing the value of firm making an IPO (Beaver, Kettler, & Scholes, 1970; Foster, 1986; Lev, 1989; Berstein & Wild, 1998; Noland & Pelvik, 1998). Moreover, Ryan (1997), based on his survey relating accounting numbers and company risk, notes the possibility of incorporating accounting information for measuring the risk of a firm making an IPO in the absence of ex post risk measures prior to the offering. Thus, the focus of the current study is to examine whether accounting measures of total firm risk are associated with the uncertainty surrounding an IPO.

There is a considerable and growing body of empirical evidence suggesting that the IPOs of common stocks are underpriced, on average. This underpricing is a widespread phenomenon and is evidenced across many capital markets (Loughran, Ritter, & Rydqvist, 1994). A number of theoretical models have been proposed to explain why IPOs of common stock are on average underpriced. For example, Baron (1982) develops an underpricing model based on information asymmetry between the issuing firm and

underwriters, while Rock (1986) and Beatty and Ritter (1986) model underpricing as a result of information asymmetry between investors. Others develop underpricing theories based on signalling hypothesis arguing that the underpricing is a means of conveying good quality IPO (Allen & Faulhaber, 1989; Grinbaltt & Hwang, 1989; Welsch, 1989). The general notion of these theories is that the pre-trading or ex ante uncertainty about the aftermarket price is the driving factor for the IPO's underpricing.

The existing underpricing theories come to a similar implication that underpricing is positively related to the ex ante uncertainty about the aftermarket price of the issue. In other words, the expected amount of underpricing increases as the uncertainty about the aftermarket of the issue increases. Empirical support for this positive association has been shown in many research papers. Yet, little attention has been given to the possible association between accounting information, in particular accounting measures of firms' total risk, and the underpricing of IPOs. While two studies (Kim et al., 1995a; Klein, 1996) have examined the pricing of IPOs, they do not investigate the relation between specific accounting risk measures and the degree of underpricing. Further, although some studies have examined the underpricing of Indonesian IPOs (Rizka, 1995; Indrajati, 1997; Hanafi, 1998, amongst others), none of these studies finds convincing support that ex ante uncertainty is positively related to the degree of underpricing. The current study is expected to provide more evidence about IPO underpricing and ex ante uncertainty, more specifically, it examines the association between accounting measures of total firm risk and the degree of underpricing in Indonesian IPOs of common stocks. Five accounting risk measures are examined: financial leverage, operating leverage, size, growth, and profitability. In addition, five control variables are examined.

A sample of 149 Indonesian IPO firms that went public during the period 1989-1997 is examined and is used to test the null hypothesis that the IPO's initial return is not related to firm specific accounting risk measures. The sample firms exclude those in the real estate, property and construction industries, finance and insurance industries, and investment companies. The findings show that three accounting measures of total risk: financial leverage, size, and firm growth, are found to be consistently related to the degree of underpricing. To check the robustness of the model, alternate measures for each of the proxies are used. Financial leverage, measured as the ratio of total debt to total assets plus the market value of the issue in the first day, is positively and significantly associated with the degree of underpricing. A negative association is found between firm size, measured as the size of the issue, and the degree of underpricing. Growth is negatively related to the degree of underpricing, which is in contrast to the expectation. The coefficients of two other accounting risk measures: operating leverage and profitability, are mixed. Overall, the results allow rejection of the null hypothesis that accounting measures of total firm risk are not related to the degree of underpricing.

Consistent with previous studies, this study documents that the portion of shares retained by the initial owners and the state of the market are significantly related to the extent of underpricing. Other findings reveal that underpricing is positively related to aftermarket standard deviation of return and is negatively related to the IPO's number of years in operation and the quality of the underwriter. Further investigation suggests that the model fits better in the situation where more firms are making IPOs (hot periods). Additional tests on the pricing of IPOs provide further evidence that the IPOs' accounting information is value relevant about the market price of the IPO, which is in support to that of Kim et al. (1995a) and Klein (1996).

Two important implications pertaining to the findings of this study are identified. First, the study has provided further evidence that the degree of underpricing is positively related to the ex ante uncertainty about the aftermarket price of the issue. Second, the results give additional support to the proposition that accounting information is value relevant about the pricing of IPOs (Kim et al., 1995a; Klein, 1996). The presence of multicollinearity among independent variables has made it difficult to draw inferences about the importance of the individual variables, in particular the accounting variables. However, as some accounting variables are found to be significantly related to the degree of underpricing, the general conclusion that accounting measures of total risk are associated with the initial returns is unaffected.

1.1 Objectives of the Study

This study has three objectives. Firstly, it examines the existence of underpricing phenomenon in Indonesian new issues of common stocks. Previous studies, such as Husnan (1993) and Hanafi (1998), have shown that on average Indonesian IPOs are underpriced. The current study extends the size of the sample, and uses different measures of the level of underpricing. Secondly, it examines the association between the degree of underpricing and accounting measures of total firm risk. The accounting risk measures used here serve as proxies for ex ante uncertainty. In particular, this study tests the predictive ability of the quality of (accounting) information disclosed in the issue prospectus. Thirdly, this study complements the findings of previous studies and expands the underpricing literature by examining this phenomenon in an emerging market. Loughran et al. (1994) suggest that short-run underpricing could be explained by

differences in the contractual mechanism governing the listing and the composition of firms going public.

1.2 Motivations of the Study

This study is motivated by suggestions made by some authors regarding the role of financial (accounting) variables in the valuation of company, in particular, in the case of IPOs. In addition to this, there have been a number of empirical studies suggesting the consistent and significant role of accounting numbers as a determinant of stock returns, known as fundamental analysis (see for example, Lev & Thiagarajan, 1993; Bernard, 1995; Abarbanell & Bushee, 1998, among others). Also, recent theoretical explanation has shown that accounting numbers indeed have value properties in explaining the value of companies, i.e., its stocks (Ohlson, 1995; Feltham & Ohlson, 1995). Moreover, an investor could earn abnormal returns by performing fundamental analysis (See for example, Chan, Hamao, & Lakonishok, 1991; Lev & Thiagarajan, 1994; Setiono & Strong, 1998; Chung & Kim, 1994; Ballester & Livnat, 1997). Bauman (1996) provides a review of the recent interest in the role of fundamental analysis.

The literature suggests that accounting numbers are potentially useful in the process of price determination of IPOs. Foster (1986) asserts that financial statement information is useful for the valuation of privately held companies, as he describes "there are many contexts in which estimates need to be placed on the value of companies that are not traded on organized markets, for example ... (b) when determining the price at which a company could go public..." (p. 422). Berstein and Wild (1998) express their view by asserting "Reliable estimates of value enable us to make buy/sell/hold decisions

regarding securities, ... determine prices for public offerings of a company's securities" (p. 641). Berstein and Wild also suggest the use of financial fundamental ratios in estimating equity values of companies whose stocks are not traded in active markets.

Supports for the potential use of accounting information in the price determination of IPOs are provided in many empirical studies. For example, Beaver et al. (1970) argue that accounting data offer superior forecasts of the market determined risk measures and conclude "... accounting risk measures can be applied to decision-settings where market determined risk measures are not available. Two such situations immediately come to mind: privately held firms 'going public' for the first time..." (p. 680). Lev (1989) challenges researchers by asking "What is the role of financial variables in unusual circumstances when market variables are nonexistent or are of limited usefulness. These include *the role of financial variables in the valuation of new public firms (initial public offerings)* ..." (p. 179, emphasise added). Finally, Nolland and Pavlik (1998) also call for accounting researchers to examine the value relevance of accounting numbers as the determinants of IPO offer price, as they question "How are market prices determined for private stock, and, in particular, what is the role of accounting numbers in the valuation estimate" (p. 94).

In summary, there have been numerous suggestions about the potential use of accounting information in the price determination of IPO of common stocks. This study is expected to examine that suggestion. There is no previously study attempting to examine the role of accounting information in the pricing of IPOs in Indonesia. Close in spirit are Kim et al. (1995a) and Klein (1996) who provide evidence on the importance of accounting variables contained in the issue prospectus in the pricing of Korean and US IPOs, respectively. Other studies appear to not specifically examine the association

between accounting information and the degree of underpricing, although many of them have included accounting numbers in their models.

1.3 Contributions of the Study

This study makes contributions in the following aspects. First, it contributes to a better understanding of the underpricing phenomenon, particularly, in an emerging capital market. Second, this study examines the firms' specific factors, i.e. accounting measures of total firm risk, in relation to the systematic underpricing of IPOs. The findings of the study are expected to enable us to distinguish risky firms from less risky ones, which consequently can be used as a trading strategy in the IPO market.

In addition, understanding the market price of newly issued shares is important for various parties, such as the issuers, underwriters, potential investors, market regulators, financial managers, and the like. In particular, understanding the factors that influence the level of underpricing is important for the issuers and prospective shareholders since underpricing results in a wealth transfer between these two parties.

Further, studying Indonesian IPOs is important for the following reasons. First, there is no previous study examining the role of accounting information in Indonesian IPO pricing. Second, the Indonesian capital market has played an important role in supporting the Indonesian economy particularly in providing capital to finance its economic growth, as shown by a significant increase both in terms of the number of listed companies and their market capitalisation. Third, the market governing body, that is the Capital Market Supervisory Agency (Badan Pengawas Pasar Modal or Bapepam), has committed to regularly improve market regulations giving more confidence among market players and the listed companies as well as potential private companies (Ruru,

1994). Fourth, the regulatory body estimates that there are more than ten thousand firms eligible for listing at the stock market which could make the Indonesian stock market the largest in the region. These facts have shown how important is the role of the stock market in sustaining Indonesian economic development (Ruru, 1994, p.150). Thus, this study is expected to provide an understanding of the nature of the Indonesian capital market in which they could be used as reference for market regulators in developing market regulations.

1.4 Dissertation Organisation

The rest of this dissertation is organised as follows. Chapter Two outlines the institutional background of the Indonesian capital markets and the process of going public. Chapter Three presents a review of the relevant literature and provides the rationale for the use of accounting information as measures of total firm risk. Chapter Four describes the study's research methodology which covers the selection of the sample and the definition and measurement of the variables. The Chapter also provides the model used for the data analysis. Chapter Five contains the results of the study and the statistical analysis. Included in Chapter Five are the sensitivity analyses, discussions of the research findings, and the examination on the pricing of IPOs. Chapter Six summarises the findings, relates the conclusion to the objectives of the study, outlines the limitations of the study, and provides recommendations for future study.

CHAPTER 2

INSTITUTIONAL BACKGROUND

This chapter presents the institutional background of the Indonesian stock markets and the process of going public in Indonesia. Section 2.1 outlines briefly the historical development of the Indonesian stock markets, in particular the Jakarta stock exchange. Section 2.2 presents the process of going public in Indonesian stock markets. The process of going public consists of three stages: the pre-filing period, waiting period, and post-effective period. The final section summarises the chapter.

2.1 A Historical Perspective of the Jakarta Stock Exchange

2.1.1 Early History

The existence of a stock exchange in Indonesia can be traced back to the early 1900s; a time when Indonesia was under Dutch rule. It was in 1912 that the first stock exchange was established in Batavia, the former name of the Indonesian capital Jakarta. The stock exchange was closed during the First World War and reopened in 1925 operating alongside parallel burses in Surabaya, East Jawa, and in Semarang, Central Jawa. The stock exchanges were again closed during the Second World War, following Japanese occupation of the country in 1942.

In 1952, seven years after the declaration of Indonesia's independence, the Jakarta stock exchange was reactivated with its main purpose of trading the pre-war issues of stocks and bonds of the Dutch corporations. The nationalisation of a large number of

Dutch corporations launched in 1956 had resulted in inactivity of the stock exchange. This continued up to the 1970s.

2.1.2 The Reopening of the Stock Exchange

It was in the early 1970s that the Indonesian government considered the need for a well-regulated stock exchange. The exchange is expected to accommodate an increased demand for capital to finance its growing economy during the economic boom as a result of oil price increase. In 1976 the government established the Capital Market Operations Board (Badan Pelaksana Pasar Modal, or Bapepam) with the main duty of supervising and managing the Jakarta Stock Exchange (JSX) and the state owned national investment company, known as PT. Danareksa.

The JSX first formally commenced operations in 1977, with the listing of the cement manufacturer PT. Semen Cibinong. Unfortunately, faced with regulatory constraints, only a few firms were sufficiently attracted to list their stocks on the JSX. Not surprisingly, up to 1988 (twelve years since its re-establishment) only 24 firms had listed on the stock exchange, with a daily trading activity averaging below US$ 50,000.

The lack of interest of corporations in listing on the JSX forced the government to deregulate the stock exchange's rules. In the meantime, there was an increase in the demand for capital to finance Indonesia's growing economy, as shown by a growth in Gross Domestic Product of 7.4% and 7.3% for 1988 and 1989, respectively. The government's concern, at that time, was of how to mobilise funds kept by Indonesian households. The 1988 deregulation, and subsequent deregulation in 1989 introduced by

the government, have increased most of the stock market's activities, such as the number of firms and trading volumes.

The significant increase in the number of firms trading on the stock market, and in the trading activities during 1989-1990, could be attributed to three factors. First, Bapepam has lifted its interference in share price formation in the new issue market. The first issue price is now fully determined by the parties involved in price quotation (the firm and the underwriter). Second, the maximum of four-percent price changes has been revoked, allowing the market to determine the price. Third, the government introduced two policies that have had a direct impact on the upswing of the market. These policies are (1) income from term deposits is no longer exempted from taxes and now is subject to 15% income tax, and (2) foreign investors are allowed to purchase up to 49 percent of the issued stocks. The government also permits private exchanges to be established, and allowed the establishment of over-the-counter (OTC) market or parallel bourse. The OTC was established in an attempt to provide more opportunity for small corporations not qualified for listing on the main board. The first private bourse in Surabaya (Surabaya Stock Exchange or SSE) was established in 1989.

The widespread endorsements of these initial reforms has resulted in a surge in new company listings and share issues, an increase in new investment, and rapid growth in market capacity. However, the so-called 'tight money policy', imposed by the government in late 1990 to control the money supply was followed by an increase in interest rates, and resulted in a downturn of market activities. The JSX index fell significantly, from as high as 680 in 1990 to 380 in 1991. The number of new listings also decreased sharply, from 65 in 1990 to only 14 in 1991.

Realising that the market is so sensitive to new government regulations, the management of the JSX introduced various measures aiming at increasing responsibilities in various capital market operations. Such measures include the management of the JSX being divested from the Bapepam, allowing foreign investors to establish joint ventures, and also simplifying procedures for the listing of companies. During 1991 (and in subsequent years) there were some new rules introduced with the aim of refining and improving market efficiencies.

2.1.3 Privatisation of JSX

The other significant improvement of the capital market is the privatisation of the JSX, which commenced in December 1991 and was effectively in operation by July 1992. The Bapepam was no longer the operation board of the capital market, but became the supervisory board, a role similar to the US's Security and Exchange Commission. Since the privatisation, the JSX has introduced some positive changes into the market. Such changes include enhancing the efficiency, professionalism, public awareness, and international recognition of the JSX. To improve efficiency, the JSX has simplified the transaction system and, since early 1993, the transference of clearing and settlement activities has been managed by a new private clearing agency, PT. Kliring Deposit Efek Indonesia. A new rating agency was established, PT. Pemeringkat Efek Indonesia, with its main aim of improving the ability to rate the quality of stocks and bonds, which will also enhance the reputation of Indonesian capital market.

The year 1993 was recognised as the second turning point of the market. During the year JSX recorded one of the best market performances among capital markets in the

world. The market index recorded a staggering increase of 113% and the market capitalisation tripled from the figure of the previous year. The strong and positive growth in 1993 resulted in an increase of firms making IPOs in 1994. The figure shows that 47 IPOs entered the market a two and a-half fold increase over the figure for 1993 (See Table 2.1 for the descriptive statistics about the Jakarta Stock Exchange).

The Indonesian stock market has taken a new step forward with the merger of the OTC and SSE in July 1995 and the introduction of the new Capital Market Law in late 1995. The new Law, which took effect in 1996, was intended to provide a comprehensive legal foundation and opportunities for several instruments and media. The year 1995 also marked a new beginning for the JSX as it moved to a new and modern building, and introduced JATS (Jakarta Automatic Trading System). The introduction of JATS has resulted in significant market improvement, especially in terms of trading settlement. By the end of 1995, the number of listed firms had grown nearly ten-fold to reach 239 compared to only 24 in 1988.

The so-called "Asian Economic Crisis", which started in the middle of 1997, has hit the market severely. Just before the crisis, the market index stood at its highest ever level of 740. Following the crisis, it started to plummet and reached its lowest ever level since 1993 of 339 before recovering to 402 by the end of the year. The impact of the crisis was so severe that more than half of all listed firms recorded losses mainly due to currency depreciation in the following financial year (mid 1998). However, the market appeared to slowly recover from the crisis as indicated by a gain of just over 10%, in terms of the market index in 1998 compared to 1997. Another direct impact of the economic crisis was that some companies were subjected to possible delisting due to consecutive losses for the previous two financial years.

Table 2.1

Descriptive Statistics of the Jakarta Stock Exchange

Year	Listed Firms	New IPOs	Market Cap. (tril.)[a]	# New Shares Offered (mil.)	New Funds Raised (bill.)[a]	Index Closed
1977	1	0	0.0	0.18	1.79	NA
1978	1	0	0.0	0.18	1.79	NA
1979	3	2	0.0	6.71	17.14	NA
1980	6	3	0.0	7.53	16.50	NA
1981	8	2	0.0	5.20	8.29	NA
1982	14	6	0.0	19.89	45.87	NA
1983	19	5	0.1	4.28	7.65	85
1984	24	5	0.1	9.25	13.66	67
1985	24	0	0.1	0	0	66
1986	24	0	0.1	0	0	69
1987	24	0	0.1	0	0	82
1988	24	0	0.5	0	0	503
1989	56	32	4.4	199.25	2,001.25	399
1990	122	66	12.4	540.32	5,025.73	417
1991	139	17	16.4	154.15	968.82	247
1992	153	14	24.8	146.80	602.95	274
1993	172	21	69.3	269.26	1,290.75	588
1994	217	47	103.8	1,054.55	4,330.73	469
1995	239	22	152.2	2,346.82	4,097.18	513
1996	253	15	215.0	2,020.24	2,439.60	637
1997	281	30	160.0	3,314.27	3,521.04	402
1998	288	7	176.0	717.00	579.20	398
TOTAL[b]	287	293		10,815.7	24,968.30	

Data are summarised from various sources.
NA is not available.
[a] The value is expressed in Indonesian Rupiah.
[b] The differences in the number of listed firms and the number of total firm making IPOs are due to some firms being delisted from the exchange.

2.2 The Process of Going Public

An IPO is set up in a highly-regulated environment. The process for going public in the Indonesian capital market is principally similar to other capital markets. Following the market deregulation in 1987-1988, the Head of Bapepam issued a number of

regulations in anticipation of the need for a well-regulated market. The regulations that elaborate the general process required for firms wishing to make an IPO were arranged in the Head of Bapepam's Decree No. 1/1988 and No. 5/1989. The guidance on the form and content of prospectus was based on the Decree No. 23/1987. Both the President's Decree No. 53 of 1990 and the Ministry of Finance's Decree No. 1548 of 1990 concerning the capital market were used as the guidance for ruling the market as well as some follow-up Decrees issued by the Head of Bapepam. The capital market law issued in 1995 (which took effect in 1996) was a replacement for the existing market rules. Table 2.2 shows the general listing requirements of common stock issued at the Jakarta Stock Exchange.

The process of going public can be broadly divided into three stages, namely the preparation or pre-filing stage, the waiting period, and the post-effective stage. Before proceeding to the discussion of each of these stages, the importance of the underwriter is first discussed.

2.2.1 The Role of Underwriter

Perez (1984) suggests that there are at least five major services provided by the underwriter to a firm making an IPO. Such services include (1) negotiating the terms of the issue with the firm, including the issue price determination, (2) supervising and assisting in the preparation of the registration statement, (3) arranging for information meetings, known as the 'road show', (4) managing the public distribution, and (5) finalising statement and delivery of the securities on the closing day. This attests the importance of the role of underwriter for a successful offering.

Table 2.2

Basic Listing Requirements of Common Stock Issues on the Jakarta Stock Exchange

1. Bapepam declares that the registration statement becomes effective;
2. The financial statement must be audited by a public accountant, registered at Bapepam with an unqualified opinion for the most recent financial year(s);
3. Minimum shares to be offered are 1 million shares;
4. Minimum number of shareholders is 200, each owning a minimum of 500 shares;
5. The company has been established and in operation for at least three years. "Established" means the company has been founded during a fiscal year by virtue of approval by the Ministry of Justice. "In operation" means the company must satisfy one of the following criteria:
   a. Issued with a permanent license from the Investment Coordinating Board;
   b. Issued with an operating license from the Ministery of relevant business sectors;
   c. In accounting terms has posted income or loss from operations;
   d. In economic terms has earned revenues or posted expenses upon its operations.
6. Has posted net earnings and operating profits during the past two fiscal years;
7. The company must have a minimum asset of Rp 20 billion, minimum shareholders' equity of Rp 7.5 billion, minimum paid up capital of Rp 2 billion, and minimum market capitalisation after public offering of Rp 4 billion;
9. The company must have board members with good reputation.

Rp stands for Indonesian Rupiah, the official currency of Indonesia.

Issuers of IPOs usually rely heavily on the expertise of the underwriter given the fact that it is the underwriter who knows the market best. Issuers may use higher quality underwriters to underwrite the issue. Underwriters with more experience in terms of the frequency of underwriting and market capitalisation, usually act as the lead underwriter, which is regarded as more prestigious and thus is associated with a better quality service.

The selection of the underwriter therefore appears to be a crucial decision that affects the success of an IPO.

The underwriting agreement usually consists of two forms, 'best effort' and 'firm commitment'. In a best effort agreement, the underwriters have no obligation to take responsibility for the unsold shares: they act as the agent for selling the shares. In other words, the underwriters use their best effort to sell the shares. Under a firm commitment agreement, the underwriters assume full responsibility for the issue given they have agreed to purchase the shares at a determined price. In other words, it is the underwriter's risk for taking any unsold shares. Thus, the risk faced by the issuers of unsold shares is greater in best effort than in firm commitment offering. The Indonesian authority recognises these two forms of IPO agreement, yet, so far, there appears to have been no best effort contract that has taken place in an Indonesian IPO.

In underwriting the issue, the underwriter may form a syndicate of underwriters. A syndicate is usually undertaken in an attempt to reduce the litigation and distribution risk. Thus, the forming of syndicate will not only spread the risk of taking unsold shares, but also help in marketing and distributing the issue.

2.2.2 The Preparation or Pre-filing Stage

The preparation of going public may take three to six months or even longer. Once the management of a firm has decided to go public, they face a stressful and tiring ongoing effort. The firm's first task, after it has decided to go public, is to hire advising agents, such as underwriter(s), an auditor, and/or a legal adviser.

The underwriter is usually chosen months before the IPO to ensure that it has had sufficient time to conduct a thorough investigation. The underwriter, in cooperation with

other advising agents, conducts a due diligence and in-depth investigation of the firm, preparing and writing the prospectus, and filing the necessary documents with the Bapepam. The due diligence and in-depth investigation are intended to ensure that all material information has been included. The firm and its underwriters are responsible for the truthfulness and completeness of the registration statement submitted to Bapepam (article 73, para 3 of 1995's CML). No statement about the proposed public offering can be made without clearance from the firm and the advising agents. Once all the documents are ready, the next step is filing the statement registration form and submitting to Bapepam. Table 2.3 outlines the procedures of filing the statement of registration for public offering of common stock in Indonesia.

2.2.3 The Waiting Period

There is a statutory forty-five day waiting period given to the firm after the registration has been filed with the Bapepam before the registration becomes effective. The forty-five day period is expected to give Bapepam sufficient time to conduct an administrative examination, and to allow information contained in the registration to be distributed to the interested parties. Article 74 of the 1995 CML describes, among other things, that the statement of registration becomes effective after the forty-five day waiting period, or an earlier date if declared effective by Bapepam unless: (1) Bapepam asks for amendments and/or additional information from the firm; or (2) the firm files an amendment to the registration statement, which means that the firm starts the waiting period over again. Registration statements cannot become effective until additional information or amendments are received.

Table 2.3

Procedures for Filing the Statement of Registration for a Public Offering of Common Stocks in Indonesian Stock Exchanges

No	Description
1	The company (issuer) must first file the Statement of Registration and other supporting document.
2	If Bapepam does not require additional documents within 30 days from the filing of the registration, the Statement of Registration is declared complete and assessment will follow.
3	If Bapepem requires the issuer to submit additional/supplementary information, the Statement of Registration is said to be refiled as at the issue date of the required information.
4	The Statement of Registration becomes effective if either of the following conditions is satisfied: 1. The passing of time: a. forty five days since the filing of the complete Statement of Registration, or b. forty five days since the last date of the submitted amendment or additional information required by Bapepam. 2. Bapepam has declared the Statement of Registration as being effective.
5	Prior to the commencement of the public offering, the following requirements must have been satisfied: a. The prospectus must have been publicly distributed. If the issuer intends to use mass media in a public offering, the short version prospectus must have been published at least in one of the national newspapers for a minimum of three days prior to the commencement of public offer.
6	The public offer must be carried out in a minimum of three working days.
7	The public offer is not allowed to exceed 180 days of the last audited financial report or 60 days since the Statement of Registration is declared effective.
8	Rationing will be conducted if the demand for the shares exceeds the offer.
9	Shares rationing must be finalised within six days of the completion of the offering period.
10	The offered shares must have been registered with Bapepam within ninety days after the commencement of the offering period or thirty days after the closing of the offering period.

The Table is summarised from the Head of Bapepam's Decree No. 44/PM/1991, Regulation No. IX.A.2. This Decree replaced the old Decrees on similar issues (011/PM/1987, 012/Pm/1987, 013/PM/1987, 01/PM/1988, and 05/PM/1989)

Once the registration statement becomes effective, the firm has to disseminate its prospectus to the public to allow potential investors to examine the firm and make necessary evaluations. It usually takes one week for the firm to produce and start distributing the issue prospectus, while the offering period varies from three to forty working days. The offering price is usually set up after the registration statement is declared effective and is printed clearly on the front page of the issue prospectus. It is uncommon to use a tender offer in determining the offering price in Indonesian IPOs.

Article 78 of CML states clearly that the prospectus shall be prohibited from containing false information on material facts or from failing to publish truthful information on material facts required so that it does not provide misleading information. There are two forms of prospectus: (1) the short version, which is usually published in newspapers, and (2) the long version. Table 2.4 outlines the information that should be contained in a prospectus. As can be seen in the Table, a prospectus usually consists of nineteen sections. It starts with the cover page and ends with the list of the trust agents. If the firm uses newspapers to advertise the shorter version prospectus, the prospectus must be published in at least one newspaper having national distribution and issued at least three days before the commencement of the public offer.

During the waiting period, any attempt to sell the stock is strictly prohibited. The public offering must be conducted over three working days, at least.

Table 2.4

Type of Information Contained in a Prospectus*

No	Description
1	Cover Page Effective date, offering periods, rationing date, listing date. Name and address of the firm. Major business line of the firm. Name of Burse(s). Type of offering. Nominal value of share, offering price and number of shares being offered. Name of underwriter(s). Statement, if any, concerning major risk relating to the issue. Place and date of prospectus issuance.
2	Prospectus summary Information specific to the firm: line of business and major risk factor(s) Ownership structure, before and after the offering, number of outstanding shares, if any, and number of shares to be outstanding, and description of ownership (those with ownership of 5% and more).
3	Uses of Proceeds Statement of the purpose and use of the proceeds from the issue: either in the form of a description or breakdown of the intended use.
4	Statement of Debt Description of debt owned by the firm as at the last financial report.
5	Management's Analysis and Overview Analysis of the company business. Analysis of financial positions including any risk associated with currency fluctuation. Analysis of any material changes in company's financial position and operations. If required, forecast financial performance may also be included.
6	Business risk Presented in order, based on the weight of the risk inherent in each of the aspects. Usually it is ranked as follows: competition, supply of materials, national or international regulations, and government policy.
7	Information about the company Short history, significant changes in ownership structure, significant events related to past operating performance, brief description of company's facilities, relation to other companies, especially in terms of ownership. Composition of the members of the board of directors followed by a description of their position and expertise. Description of human resources, which covers details of the number of employees, position, education, foreign expatriates, and, if any, welfare facilities.

Table 2.4 (continued)

8 Activities and Company Business Prospects
Production and operations, which include a description and analysis of risk related to supply of materials, production capacity, products and services, marketing, and risk related to products.

9 Description on Significant Financial Information
Statement of whether the data are audited or not and whether the financial reports comply with the existing accounting regulations.
Comparison of financial ratios with industry ratios.
Financial information for the last five years or since the incorporation of the company.

10 Equity
Description of company's equity as in its last financial report.
Chronological description of capital structure prior to the IPO date.
Pro forma capital structure.

11 Dividend Policy
Information on company's dividend policy including the percentage range of cash dividend in the near future.

12 Taxation
Description of the tax system applied specifically to the firm.

13 Underwriting Agreement
Description of the underwriting agreement, such as type of underwriting, the amount shares being offered, and the methods used to determine the offer price.

14 Capital Market Supporting Institutions.
Name and address of trust agents, legal consultant, accountant, and valuer.

15 Legal Consultant's Reports

16 Financial Report
Report of independent accountant.
Financial reports of the last three fiscal years or since the incorporation of the company. The reports consist of balance sheets, income and loss statement, changes in retained earnings, cash flow statements, notes to the financial reports, and other significant information.

17 Valuer's Reports, if any

18 Requirements for Subscription of the Shares

19 Management of the Distribution of the Prospectus

*The type of information covered in this table is for a public offering of common stocks. Different contents are presented for debt offerings. Note also that not all prospectuses are structured identically and thus differences between prospectuses are apparently present.
The Table is summarised from the Head of Bapepam's Decree No. 15/PM/1996, Regulation No. IX.C.2. This Decree replaces the old ones (23/PM/1991 and 23/PM/1987).

2.2.4 The Post-effective Period

The firm's securities can only be sold when the registration statement has been declared effective. As soon as the registration becomes effective, the prohibition against selling the securities is lifted. The firm can then sell the securities to investors provided the investors have previously received a prospectus. The market price will be established once the initial purchasers of the IPO shares trade the shares in the secondary market. The firm is now entering its new environment as a public company.

2.3 Chapter Summary

This Chapter has discussed the institutional background of the Indonesian stock markets. The first section described the early history of Indonesian stock exchange followed by the latest development of the exchange. The process of going public, which consists of three stages, was then briefly presented in Section two. The next chapter provides a review of the literature.

CHAPTER 3

LITERATURE REVIEW

This chapter presents a review of the literature. The first section evaluates the importance of the issue prospectus in providing information for valuation of an IPO. Section two presents evidence about IPO underpricing, reviews the existing underpricing models, and explains why ex ante uncertainty is related to the extent of underpricing. The section also discusses the nature of ex ante uncertainty and its association with total firm risk. Section three provides arguments that accounting risk measures can be used as proxies for total firm risk. Section four outlines studies of IPOs, with reliance given to studies examining the cross-sectional variation of initial excess returns. Section five presents the study's research questions. The final section summaries the chapter.

3.1 The Role of the Issue Prospectus in IPO Valuation

It is mandatory for a firm wishing to issue common stocks through going public to provide a prospectus. The issuing firm uses the prospectus as one of the main legal means to convey information about the firm. The Indonesian capital market law (CML) asserts that a prospectus should provide information relevant for potential investors for their investment decision analysis, and that issuers are responsible for the information they give. It should contain information about, among other things, the firm, its business and prospects, and the latest financial positions (Refer to Table 2.3 for information contained in a prospectus). Thus, the issue prospectus is seen as a mechanism by which

prospective investors are provided with information useful for valuation purposes, although the available information may not capture all the required information.

Unlike a seasoned offering where information about the firm is already available, in the case of an IPO very little information is available prior to the issuance of a prospectus as the firm is privately held. Since potential investors generally do not gather information in the periods prior to the offering, they may rely on accounting information about the past performance of the firm disclosed in the prospectus. As a large part of the information contained in the prospectus is financial accounting information, we may argue that this information represents a reliable source of information for valuing the issuing firm.

Financial accounting information is believed to play an important role in IPO valuation. Perez (1984), Bloch (1986), Sutton and Benedetto (1988), and Buck (1990) present anecdotal evidence suggesting that underwriters conduct a careful comparison of various factors in determining the offer price of an IPO. These factors include some key financial ratios, current price-earnings ratios, and other key qualities of comparable firms trading in the market. This suggests that financial information available in the issuing firm prospectus is crucial and, because such information must comply with regulations required by stock market governing bodies, it must be regarded as accountable.

Historical financial statement data may provide outside investors with a measure of the firm's success in initiating and managing operations. Empirical evidence shows support for the claim of the use of accounting information as a means of valuing an IPO. For example, Downes and Heinkel (1982) find that sales and earnings are highly significant in explaining the market value of a firm making an IPO. Also, there is evidence that additional accounting information, such as earnings forecasts, is perceived

to be a credible signal by market participants (Buckland & Davis, 1990; Clarkson, Dontoh, Richardson, & Sefcik, 1994; How, 1996). Kim et al (1995a) and Klein (1996) provide a direct test that accounting information contained in the prospectus is value relevant.

Apart from financial information, the issuers of an IPO also reveal certain information that could be useful to the valuation by potential investors. This information could be certain actions and/or signals taken by the issuers which could be used to communicate and thus act as a means of conveying the firm's future prospects. These include, amongst others, the portion of ownership retained by the issuers, the investment bankers that underwrite the issue, the auditors that audit the issue, and the use of the proceeds of the issue. Thus, to be able to rationally justify the value of the issuing firm, potential investors must not only evaluate the observable information as disclosed in the prospectus, but must also interpret any direct actions or signals of the entrepreneurs.

To summarise, the information available in the issuing firm's prospectus, particularly accounting information and certain signals taken by the issuers, appears to be useful for valuation of an IPO given no market price information available prior to the offering. The investment community has less ability to gather information on privately held firms because disclosure requirements are limited for these firms. This has resulted in market participants possessing little, if any, information about the IPO firms compared to information they possess about the publicly traded ones. Thus, it seems that reliance on the issue prospectus is a must. Accordingly, potential investors in the IPO market must utilise information available in the issue prospectus to make their investment decision about the IPO in order to make a proper judgement.

3.2 Underpricing, Theories about IPO Underpricing, and Ex Ante Uncertainty

3.2.1 Underpricing in an IPO

There has been mounting evidence indicating that IPOs of common stocks are on average underpriced. That is, the initial aftermarket price is significantly higher than the offer price. Underpricing is a widespread phenomenon and is apparent in almost every capital market in the world.[1] (See the summary of underpricing phenomenon in various countries in Ibbotson et al., 1988, 1994; Loughran et al., 1994; Ibbotson & Ritter, 1995; Ritter, 1998). Some theories have been advanced to explain the phenomenon. However, researchers still consider that the issue is a mystery, which requires further investigation.

Table 3.1 presents comparative evidence about IPOs of common stock and underpricing in various countries. The Table complements the existing summaries presented in various papers. As can be seen from the Table, underpricing is a widespread phenomenon, regardless of the measures used to calculate the degree of underpricing. Panel A presents evidence of underpricing among developed markets, while Panel B presents evidence for emerging markets. The magnitudes of IPO initial returns vary across countries with more underpricing experienced in emerging markets and less underpricing in more established markets. For example, among developed markets, the highest initial return of 51.9% is found in Japan, while for emerging markets the highest initial return of 289.2% is found in China. Some factors were found to have an impact on the level of underpricing differences between countries, which include institutional arrangements, offering price determination methods, and selling methods (Loughran et al., 1994).

[1] Apart from the underpricing phenomenon, an IPO of common stock is also associated with hot issue markets and the extent of underpricing phenomenon and long-run under-performance (Ritter, 1991).

Table 3.1

Comparative Evidence about IPOs of Common Stock and Underpricing in Various Countries[x]

Country	Study	Sample Period	Sample Size	Initial Return %[a]
Panel A: Research in IPO Underpricing in Developed Markets				
Australia	Finn & Higham (1988)	1966-1978	93	29.2
	How & Low (1993)	1979-1989	523	16.4
	How et al. (1995)	1980-1990	340	19.7
	How (1996)	1979-1990	266	21.8
Belgium	Rogiers et al. (1993)[b]	1984-1990	28	10.1
Canada	Jog & Riding (1987)	1971-1983	100	9.3
	Jog & Srivastava (1995)	1971-1992	254	7.4
	Clarkson & Merkley (1994)	1984-1987	180	6.4
Finland	Keloharju (1993)	1984-1992	91	14.4
France	Husson & Jacquillat (1989)	1983-1986	131	4.2
Germany	Steib & Mohan (1997)	1988-1994	103	6.8
Italy	Cherubini & Ratti (1992)[b]	1985-1991	75	27.1
Japan	Kaneko & Pettway (1994)	1989-1993	37	12.0
	Pettway & Kaneko (1996)	1981-1993	147	49.5
	Dawson & Hiraki (1985)	1979-1984	106	51.9
New Zealand	Firth (1997)	1979-1987	143	25.9
Singapore	Dawson (1987)	1978-1983	39	39.4
	Koh and Walter (1989)	1973-1987	66	27.0
	Lee et al. (1996b)	1987-1992	132	31.4
Spain	Rahnema et al. (1992)[b]	1985-1990	71	35.0
Sweden	Rydqvist (1993)	1970-1991	251	34.1
Switzerland	Kunz & Aggarwal (1994)	1983-1989	42	35.8
The Netherlands	Wessels (1989)	1982-1991	72	7.2
U.K.	Davis & Yeomans (1976)	1965-1971	174	8.5
	Buckland et al. (1981)	1965-1975	297	9.7
	Levis (1993)	1980-1988	712	14.3
	Jenkinson (1990)	1985-1989	227	11.9
U.S.A.	Louge (1973)	1965-1969	250	41.7
	Ibbotson (1974)	1960-1969	120	11.4
	Ibbotson & Jaffe (1975)	1960-1970	2,650	16.8
	Reilly (1977)	1972-1975	486	10.9
	Ritter (1984)	1960-1982	5,126	18.8
	Ritter (1987)	1977-1982	664	14.8
	Chalk & Peavy (1987)	1975-1982	649	21.7
	Miller & Reilly (1987)	1982-1983	510	9.9
	Carter & Manaster (1990)	1979-1983	501	16.8

Table 3.1. (Continued)

Country	Study	Sample Period	Sample Size	Initial Return %[a]
Panel A (continued)				
U.S.A.	Ibbotson, Ritter & Rydqvist (1994)	1960-1992	10,626	15.3
	Ibbotson, Sindelar & Ritter (1994)	1975-1984	2,439	20.7
	Jain & Kini (1994)	1976-1988	682	7.25
	Clarkson (1994)	1976-1985	420	13.9
	Chishty et al. (1996)	1979-1984	599	10.8
Panel B: Researches in IPO Underpricing in Emerging Markets				
Brazil	Aggarwal et al. (1993)	1979-1990	62	78.5
Chile	Aggarwal et al. (1993)	1982-1990	19	16.3
China	Mok & Hui (1998)	1990-1993	87[c]	289.2
		1990-1993	22[d]	26.0
Hong Kong	McGuinness (1992)	1980-1990	80	17.6
	McGuinness (1993)	1980-1990	92	16.6
	Dawson (1987)	1978-1983	21	13.8
Greece	Kazantzis & Thomas (1996)	1987-1994	129	50.9
India	Krishnamurti & Kumar (1994)[b]	1992-1993	98	35.3
Korea	Dhatt et al. (1993)	1980-1990	347	78.1
	Kim et al. (1993)	1988-1990	177	57.5
Malaysia	Dawson (1987)	1978-1983	21	166.6
	Paudyal et al. (1998)	1984-1995	18[e]	104.7
		1984-1995	77	53.7
Mexico	Aggarwal et al. (1993)	1987-1990	37	33.0
Portugal	Alpalhao (1992)[f]	-	-	54.0
Taiwan	Chen (1992)	1971-1990	168	45.0
	Huang (1999)	1971-1995	311	42.6
Thailand	Wethyavivorn & Koo-smith (1991)	1988-1989	32	58.1

[x] The classification between developed and emerging markets is based on the International Finance Corporation (1997).

[a] The measure of initial returns varies considerably across studies and is generally defined as the percentage increase from the offer price to a closing price shortly after the start of the trading. The length of the period used in these studies varies considerably. Some take the difference between the first closing price and the offer price, some adjust for market returns, and also some take the average price and/or the first week closing price. The initial returns reported here do not consider the measures used to calculate the initial returns.

[b] This indicates a study quoted either from Loughran et al. (1994), or Ibbotson and Ritter (1995) or Ritter (1998).

[c] This sample is for type A-share offering.

[d] This sample is for type B-share offering.

[e] This sample represents the privatisation IPOs.

[f] As cited in Kazantzis and Thomas (1996).

Research in IPOs has also been conducted in Indonesia. Table 3.2 presents a summary of Indonesian studies on IPO underpricing. The Table shows that Indonesian IPOs are also on average underpriced. Evidence from seven studies examining the underpricing phenomenon in Indonesia suggests the magnitudes of underpricing vary from 2.9 to 20.9%. The studies cover the periods from 1989 (the early booming of the market) to 1998. An early study by Husnan (1991) showed that IPO firms going public in 1989 (24 firms) and 1990 (22 firms) were significantly underpriced by 20.9% and 2.9%, respectively, at the end of their first week of trading. Rizka (1995) found that a sample of 114 IPO firms going public in 1989 to 1994 was subject to a significant underpricing of 12.5%. A more recent study, examining 106 firms representing seven industries, also showed a significant, and even greater, underpricing of 15.1% in the first day of trading (Hanafi, 1998).

Table 3.2

Indonesian Studies on IPO Underpricing

Study	Sample Period	Sample Size	Initial Return %	Stand. Dev. of Return %
Husnan (1991)	1989	22	20.9[a]	NR
	1990	22	2.9[a]	NR
Husnan (1994)	1989	24	19.8[a]	NR
	1992	10	9.8[a]	NR
Hanafi & Husnan (1991)	1990	38	2.9[a]	NR
Rizka (1995)	1989-1994	114	12.5[b]	22.93
Indrajati (1997)	1994-1997	65	4.4[b]	8.74
Hanafi (1998)	1989-1994	106	15.1[c]	NR
Sautma (1998)	1992-1996	153	10.1[b]	17.23

[a] Based on market adjusted one week returns.
[b] Based on the first day closing price.
[c] Based on market adjusted first day returns.
NR stands for not reported.

The evidence of significant underpricing reported in Table 3.2 interestingly shows that Indonesian IPOs experience a lower level of underpricing compared to IPOs in other emerging capital markets as reported in Table 3.1. This lower level of underpricing raises some questions. For example, are there any specific factors inherent in the issuing firms that affect the extent of underpricing in the Indonesian IPO market, or is this lower level of underpricing attributable to the Indonesian market regulation constraints or institutional arrangements? The current study is expected to provide answers to these questions. In addition, the figures on the standard deviation, which is almost double the figure of mean values, may require further examination.

3.2.2 Explanation for Underpricing of an IPO

The finding of systematic underpricing in the IPOs of common stocks has led to the development of theoretical models designed to explain this phenomenon. These models, among others, include the information asymmetry hypothesis (Baron, 1982; Rock, 1986; Beatty & Ritter, 1986), the signalling hypothesis (Grinblatt & Hwang, 1989; Allen & Faulhaber, 1989; Welch, 1989), the litigation or lawsuit avoidance hypothesis (Tinic, 1988; Hughes & Thakor, 1992), and the reputation effect hypothesis (Titman & Trueman, 1986; Beatty, 1989; Balvers, McDonald & Miller, 1988). Each of these theories is briefly reviewed next (Some writers have presented the theories in more detail. See for example Anderson et al., 1995 and Jenkinson and Ljungqvist, 1996). Note also that different writers term each of the theories differently.

Baron (1982) develops a theory, known as the investment banker monopsony power hypothesis or principal agent hypothesis, arguing that underpricing exists as a result of information asymmetry between issuers and underwriters. Baron assumes that

the underwriters possess better information about the demand from the market than the issuers do. Issuers, as the principal, must compensate the underwriters, as the agent, for their superior information. Baron argues that the more uncertain the value of the issuing firm the greater is the asymmetry of information between issuers and underwriters. This makes the service provided by the underwriters more valuable, resulting in the underwriters demanding greater discounts as the risk of the issue increases.

One testable implication of Baron's model is that underwriting firms who want to go public will experience lower underpricing given that they do not have asymmetry problems. Empirical evidence, however, does not strongly support Baron's model. Muscarella and Vetsuypens (1989) examine the initial return behaviour of investment bank IPOs. In this self-marketed IPO, which is arguably no information asymmetry, an investment bank promoted and distributed its own shares, Muscarella and Vetsuypens found that these IPOs underprice their shares by as much as other IPOs of similar size.

Rock (1986) develops a model of underpricing equilibrium by assuming that there is asymmetric information between investors. Rock's model is known as the adverse selection or winner's curse hypothesis. In this model, the issuing firm, investment bankers, and investors are assumed to be uncertain about the true value of the issue. This is termed as ex ante uncertainty. However, by incurring certain costs some investors became informed about the true value of the issue. Those investors who are assumed to possess perfect or superior information are termed "informed investors", while those who have less or no information advantages are termed "uninformed investors". Informed investors will only subscribe when an issue is underpriced and will avoid subscribing to an issue they expect to be overpriced whereas uninformed investors will subscribe to all issues because they don't know which issues are going to be

underpriced or overpriced. As a result, uninformed investors will be allocated all of the least desirable shares and they will be allocated a fraction of the most desirable shares. Uninformed investors face a winner's curse, that is, they receive all the shares they demand because the informed investors don't want them. To compensate uninformed investors for their expected loss on subscription to new issues and to make them stay in the market, the issue must be on average underpriced. Beatty and Ritter (1986), Koh and Walter (1989), Levis (1990), Keloharju (1993), and Lee et al. (1996b) empirically support Rock's winner's curse model. However, McGuinness (1993) does not find support for Rock's model in Hong Kong IPOs.

Beatty and Ritter (1986) extend Rock's model. Beatty and Ritter argue that there is a positive relation between the degree of uncertainty over the issuing firm's share value and the extent of underpricing. (Note that share value is measured in terms of the distribution of its value). Given that there is more uncertainty about the value of the issuing firm, indicated by more widely dispersed value, it is more important to know the probabilities of getting good rather than bad shares since bad shares become even worse. Thus, for more highly speculative offerings, the adverse selection becomes a more serious problem. In other words, as the winner's curse problem intensifies, the uninformed investors will submit the order to purchase the offer if the issue is underpriced, on average, which in turn increases the ex ante uncertainty of the issue.[2]

[2] Beatty and Ritter (1986) provide an intuitive illustration to support their argument. They contend that an investor who decides to gather information is in a similar position to investing a call option on an IPO. He/she will exercise if the true price exceeds the strike price (i.e., the offering price). As the value of this option increases in the extent of uncertainty, there will be more investors who are willing to become informed. As the winner's curse intensifies and more investors are getting informed, there is a greater need that the issue must be underpriced to compensate their information acquisition.

The implication of the Rock model and its extension by Beatty and Ritter (1986) is that the underpricing of new issues is related to the extent of ex ante uncertainty concerning the value of the issue. This suggests that the greater the number of investors who are willing to become informed, the greater will be the winner's curse problem faced by the uninformed investors. Thus, ex ante uncertainty and the level of underpricing should be positively correlated. Ritter (1984) and Beatty and Ritter (1986) empirically support this proposition. Ritter finds that there is a positive relation between two proxies for risk measures, sales and age, and the degree of underpricing. Beatty and Ritter use two proxies for ex ante uncertainty, the number of uses of proceeds listed in the prospectus and the issue size, and find that the degree of underpricing is positively related to the selected proxies. These findings confirm their prediction that the greater the ex ante uncertainty the greater the degree of underpricing.[3]

Tinic (1988) proposes the litigation or lawsuit avoidance hypothesis. Tinic argues that the risk of legal liabilities and potential damages to the underwriters' reputation are related to the performance of due diligence examinations of the IPO. He hypothesises that underpricing serves as a means of reducing insurance against any possible damages, that is, investors' lawsuit risks. Tinic provides support for his theory, but Drake and Vetsuypens (1993) and Jenkinson (1990), among others, do not find evidence that underpricing is necessary in order to avoid legal liability for misstatement in the IPO prospectus.

[3] Other proxies for ex ante uncertainty known to be positively related to the degree of underpricing, among others, are the standard deviation of early daily aftermarket returns (Ritter, 1984), daily trade volume in early aftermarket (Miller & Reilly, 1987), the inclusion of earnings forecasts (Clarkson & Merkley, 1994; How, 1996), and the implicit role of bank lending and/or credit relationships (James & Wier, 1990; Slovin & Young, 1990; Garfinkel, 1993; Hedge & Miller, 1996).

Grinblatt and Hwang (1989) and Allen and Faulhaber (1989) advance the signalling hypothesis proposed initially by Leland and Pyle (1977). Leland and Pyle argue that the level of ownership held by the initial owners reflects the quality of an issue. The intuition behind this hypothesis is that issuers are willing to sell their shares at a discount (i.e., at a lower price than actual value) upon the expectation that investors will justify the firm as having a high quality project. The theory assumes that the issuers have a valuable project and they intend to demonstrate it via the level of shares they retain. As holding higher ownership is risky and since issuers are risk averse, discounting the offer price is necessary to demonstrate the worth of the signal, shown by α which is the proportion of the shares retained by the issuers, although it is costly. Empirical evidence, however, provides mixed results. For example, while Hedge and Miller (1996) and Lee et al. (1996b) find negative and significant relationships between the level of ownership retention and the degree of underpricing, Keasy and Short (1992) and Lee et al. (1996a) find a significant positive relationship.

Welch (1989) also develops a theory based on the signalling approach. Welch's theory follows the dynamic issue strategy in which an unseasoned offering will be followed immediately by a seasoned offering. Welch argues that a high quality IPO firm is willing to underprice the issue upon the expectation that they can conduct a second issue with a better price. Welch finds that about one-third of IPO firms covered in his study made a seasoned offering within the next three years, a finding that would be supportive of his model. Other studies, however, find no support of Welch's proposition. Garfinkel (1993), Michaely and Shaw (1993), and Jain (1995) do not find that initial returns and subsequent offering are related.

Titman and Trueman (1986), followed by Balvers et al. (1988) and Beatty (1989), present the reputation effect hypothesis. Titman and Trueman, argue that issuers will hire more prestigious auditors to credibly signal the quality of the firm. Larger firms and less risky firms tend to hire prestigious auditors in an attempt to show their low risk characteristics to the market and thus avoid greater underpricing. Titman and Trueman assert that their model of auditor quality can be extended to the quality of underwriter. Carter and Manaster (1990), borrowing Titman and Trueman's concepts, develop a testable model in which an offering firm signals its quality via its choice of an underwriter's quality. Empirical evidence shows that the degree of underpricing is negatively related to the quality of the auditors (Balvers et al., 1988; Affleck-Graves et al., 1993, among others) and is negatively related to the quality of the underwriters (Johnson & Miller, 1988; Carter & Manaster, 1990; How et al., 1994, among others). McGuinnes (1993), however, does not find evidence that either the quality of auditor or underwriter is negatively related to initial excess returns in Hong Kong IPOs.

Apart from the above models, Klein and Leffler (1981) and Johnson and Miller (1988) propose the certification hypothesis, Chalk and Peavy (1987) and Finn and Higham (1988) focus on the institutional nature of the IPO bidding process, Welch (1992) advocates the cascades hypothesis, and Ruud (1993) advances the stabilisation or price support hypothesis. Ibbotson and Ritter (1995) provide a review for each of these hypotheses as well as other hypotheses.

The existing underpricing equilibrium models come to similar implications that the degree of underpricing is positively related to the extent of uncertainty about the value of the IPO, a proposition that is generally confirmed in most empirical research. However, Anderson et al. (1995) pointed out that there is one potential problem arising

from testing the IPO underpricing models. That is the problem of selecting a representative proxy. Because asymmetric information is not directly observable, researchers must infer certain observable proxy variables that closely represent the assumptions of the underlying models.[4] The implication of this problem is that researchers must carefully select the appropriate proxies for ex ante uncertainty so he/she can test the model more precisely. Yet, empirical evidence showed that this is not an easy task, which obviously has provided mixed results amongst several studies.

3.2.3 Ex Ante Uncertainty and Total Firm Risk

It has been shown that there are a number of models directed to explain the underpricing equilibrium. Each of the models comes to a similar implication that the extent of underpricing is positively related to ex ante uncertainty. That is, the greater the ex ante uncertainty surrounding the IPO the greater is the level of underpricing of the issue. Because ex ante uncertainty is explicitly unobservable, researchers must use proxies. The current study argues, as shown later, that accounting measures of total firm risk can be used as proxies for ex ante uncertainty and therefore they could explain the extent of underpricing. This section will discuss the nature of ex ante uncertainty followed by the interaction between total firm risk and ex ante uncertainty.

Ex ante uncertainty is defined as the variance of the distribution of initial returns of an IPO, that is the uncertainty about its aftermarket price (Beatty, 1989). In this case, ex ante uncertainty is a pre-trading concept and disappears once the market price is

[4] Anderson et al. (1996) identify two dissimilar paths of efforts that attempt to test the underpricing theories. The first path attempts to seek proxy variables that best represent the model. Thus, the success of the test depends on the success in selecting the proxies. The second path avoids the use of proxy variables and restricts the analysis of the observable magnitudes indicated by the models. Anderson et al. note that there is little, if any, effort testing the latter path.

known. The central issue for investors in IPO markets is how to reduce ex ante uncertainty. The uncertainty of the aftermarket prices makes investors use their knowledge to predict the distribution of aftermarket prices. Individual investors, however, have difficulties in aggregating information into a single price due to differences in their weights given to each item of information. As each potential investor possesses different knowledge and information acquisition on a particular IPO, there will be a disparity in their ability to estimate the distribution of aftermarket prices, which could lead to a greater variance of the distribution of aftermarket prices. Thus, if the variance of the distribution of aftermarket prices increases, the ex ante uncertainty of the IPO will also increase indicating a positive relationship between them.

Ex ante uncertainty is different from total firm risk (total risk, hereafter). Note that total risk is the variance of aftermarket returns and it contains systematic and unsystematic components. Unlike total risk or systematic risk, ex ante uncertainty is not a temporal concept. This means that ex ante uncertainty does not reflect the expected variability of return over time instead it reflects the variance of the distribution of possible aftermarket prices. Unlike the situation with the already traded stocks where the trading strategies merely involve a change when new information becomes available, in an IPO setting investors do not know all the exact information they need to value the offered stocks. Investors in the IPO market must incorporate a large amount of information, given there is no clear direction on how the market aggregates the information. Thus, investors in the IPO market are faced with greater uncertainty compared to those in the already traded stocks. Hence, it can be argued that total risk and ex ante uncertainty can independently exist.

Total risk and ex ante uncertainty, however, may correlate with each other when there is different interpretation of financial accounting information among investors. This interpretation difference results in perception differences among investors about the probability of receiving future cash flows based on their assessment of financial accounting information.[5] Such differences occur when each investor interprets the available financial accounting information differently resulting in different probabilities of their expectations about future cash flows (See the detail in Beaver, 1986). Thus, there is heterogenous belief among investors. This is in line with the winners' curse explanation, which requires both uncertainty about the true value of the IPO and potential investors who are heterogeneously informed about that value. Thus, each investor would interpret and weight the firm's available financial statements differently.

Recall that total risk is defined as the variance of aftermarket returns. Returns are defined as a function of price, while price itself is dependent on the estimation of future cash flows. This relationship can be expressed as $\sigma^2(R_i) = f\,[\sigma^2(P_i)] = f\,\{\sigma^2[E(CF_i)]\}$, where R is the return, P is price, and CF is cash flow, all in period i. This equation implies that the variability of future cash flows determines the variability of stock prices which in turn determines the variability of stock returns. This means that the greater the variance of the firm's stock price the greater will be the variance of returns. This suggests that the variance of returns is sensitive to the changes in a firm's stock price. Thus, as a firm's cash flow sensitivity determines the variability of its stock prices we can argue that total risk is also sensitive to the variability of expected future cash flows.

[5] This assumption is important because if investors have homogenous beliefs, they will have similar risk perception, which is almost impossible in the real world.

In other words, the variability of the distribution of expected future cash flows determines total risk.

Like total firm risk, ex ante uncertainty is also sensitive to the variability of expected future cash flows. Recall that investors must predict the distribution of aftermarket prices by aggregating all possible sets of information. Unlike investors in previously traded stocks, investors in the IPO market must estimate the aftermarket price before the trading of the IPO begins. It is more difficult for investors in the IPO market to estimate the distribution of aftermarket price given that there is no price information prior to the listing. This could lead to a greater variance in investors' estimation of the distribution of expected future cash flows. Thus, when the variance of the distribution of expected future cash flows is more uncertain, individual investors will face greater uncertainty about the aftermarket prices resulting in higher ex ante uncertainty. Similarly, it is easier for individual investors to estimate the aftermarket price when there is a low variability in his/her expectation about the distribution of future cash flows resulting in lower ex ante uncertainty. Thus, ex ante uncertainty is clearly dependent on the variability of investors' estimation on expected future cash flows. In other words, the variability of the distribution of expected future cash flows determines ex ante uncertainty.

To summarise, it is now clear that either ex ante uncertainty or total risk depends on the expectation of future cash flows, although the estimation about future cash flows between them is somewhat different. Since either total risk or ex ante uncertainty relies on the estimation of expected future cash flows, we can argue that a positive correlation might exist between them. Accordingly, total risk could be used as an appropriate proxy for ex ante uncertainty. The question now is "can accounting numbers be used as proxy

for total risk and accordingly as the proxy for ex ante uncertainty?". The next section will discuss this possibility.

3.3 Accounting Risk Measures as Proxies for Total Firm Risk

It has been argued that total risk and ex ante uncertainty have a positive correlation. As this study investigates the association between accounting measures of total risk and the magnitudes of underpricing, it is necessary to identify accounting risk measures that can be used as proxies for total risk and thus ex ante uncertainty. But, before doing so, I will discuss the role of accounting information in the business enterprise, particularly in the case of corporate valuation, and follow this by asserting that accounting information can proxy total risk.

The Statement of Financial Accounting Concept (SFAC) No. 1 of Accounting Principles Board (1978, p. 5) posits that the primary objective of accounting is to provide information useful for investment decision-making. Thus, accounting information per se is aimed at understanding the performance of a company, which later can be used to make rational judgments for any investment decision-making. The SFAC No. 1 (p. 5-8) also postulates that accounting information can be useful in changing or refining the beliefs and expectations of individual investors or interested parties since accounting data measures the economic fundamentals of a company (reporting entity). Beaver (1986) also asserts that accounting data could alter the beliefs of individuals regarding their perception of the performance of the companies.

The accounting literature suggests that one of the major roles of accounting is to provide information on the structure and functional behaviour in performance evaluation of a business corporation that is useful for all types of users. For example, empirical

studies have shown that accounting information is used to predict bankruptcy, determine bond rating, and evaluate equity risk (See the review in Watts & Zimmerman, 1986; White et al., 1998). In addition, accounting information has also been used in the performance evaluation of corporate contracts. For example, DeAngelo (1990) asserts that accounting information plays a crucial role in the equity valuation of a buy-out offer. This suggests that accounting information has been widely used in corporate valuation.

Furthermore, Kaplan (1978) and Watts and Zimmerman (1986), in a review of the information content of financial accounting numbers, conclude that accounting numbers do have information content and are useful in determining stock returns. Kaplan asserts that there are two important roles of accounting data: they affect the unexpected security returns and they affect the riskiness of a security. Brennan (1995) also suggests that accounting information is considered as value relevant for determining stock prices. Thus, at this stage, it appears that the usefulness of accounting information in determining the riskiness of a security (and thus the corporation) has been confirmed theoretically and empirically. Next, I will present further empirical research giving support to the notion that accounting information is useful for corporate valuation.

Following Ball and Brown's (1968) seminal paper that finds a significant association between earnings and returns, there has been a long debate concerning the relative role of accounting variables for stock price valuation. Among those who appear to be pessimistic is Lev (1989), arguing that, although there is a statistically significant relationship between earnings and returns, the explanatory power is still low, indicating a lack of economic significance. Lev's comment has challenged accounting researchers. Equipped with refined research designs, accounting researchers have further provided evidence that some accounting variables, taken from the firm's financial statements, are

value relevant and could be used to predict stock prices (See for example, Ou & Penmann, 1989; Ou, 1990; Holthausen & Larker, 1992; Lev & Thiagarajan, 1993; Chung & Kim, 1994; Ballester & Livnat, 1997; Setiono & Strong, 1998).[6] This line of research is known as fundamental analysis research. Fundamental analysis involves the determination of the value of securities with particular reliance on accounting information.

Attempts to further refine the possible relation between accounting numbers and the value of a firm are proposed by Ohlson (1995) and Feltham and Ohlson (1995). Ohlson and Feltham and Ohlson argue, theoretically, that basic accounting variables, such as earnings, return on equity, and book values could be used to express firm value and thus are relevant for stock price valuation. Bernard (1995), who empirically supports the model, has acknowledged it as being the breakthrough in fundamental analysis research. This theoretical analysis appears to underpin the notion that some accounting variables are value relevant and accordingly are regarded as important factors for determining the true value of a firm and, thus, the riskiness of the firm. Bauman (1996), based on a review of fundamental analysis research in accounting, concludes that financial statements contain information useful for prediction of firm value. Ryan (1997) also advocates a similar conclusion.

To summarise, it is clear that accounting information is value relevant for securities price determination. Thus, given that there is support for the usefulness of

[6] Black, Chavis, and Elmendorf (1997) find strong evidence of the usefulness of financial statement information in explaining future profitability for emerging-growth firms. Note that as one of the basic characteristics of IPO firms is as growing company, Black's et al. findings could be representative and be generalised to IPO firms. Amir and Lev (1996) find that accounting information has little, if any, relevance in stock price prediction in their study of wireless communications industry. Amir and Lev, however, point out that their study is based on a single type of industry that could not be generalised to other types of industries.

accounting information as a risk determinant in corporate valuation, it is therefore necessary to identify which accounting information is persistently related to risk.

The first empirical study examining the relationship between accounting information and total and systematic risk would be Beaver et al (1970). Unlike previous studies, which suggest that beta is the appropriate measure for determining the riskiness of a security, Beaver et al. posit that accounting information also has value relevance given that the accounting system generates information that could be considered as a measure of risk. They further argue that accounting risk measures can be employed as surrogates for total variability of returns that reflect either the systematic or individual risk components. As accounting information can reflect a firm's risk, it is reasonable to use them as surrogates for firms' systematic risk.

Beaver et al. (1970) run regressions between market determined systematic risk and selected accounting risk measures. Beaver et al. find that their selected accounting measures of risk, which include dividend pay-out ratio, assets growth, financial leverage, liquidity, assets size, earning variability, and earnings covariability, are related to the market-based risk measure. They conclude that accounting numbers provide superior forecasts of the market determined risk measure, giving support for the potential usefulness of accounting data to investors. Beaver et al. go on to assert that accounting information implicitly supplies assistance for risk assessment. Following Beaver et al., Eskew (1979) and Dhingra (1982) find that their selected accounting measures have superior ability in predicting systematic risk.

Other studies have focused on the examination of single or certain accounting variables. Lev (1974) finds that there is an association between total risk and operating leverage. Ben-Zion and Shalit (1975) also find that firm size, financial leverage, and the

dividend record determine systematic equity risk. Hamada (1969) and Brealey and Myers (1996) assert that financial leverage is related to security returns because the introduction of new debt may cause investors to believe that the firm is more risky leading them to ask for higher returns. Foster (1986) and Christie (1982) support this proposition. Further, Christie posits that the variance of equity returns is a function of financial leverage. Beaver and Manegold (1975) show that accounting measures of systematic risk appear to be only one of the explanatory factors determining systematic risk. Belkaoui (1978) reported that selected accounting ratios are related to the systematic risk of common stocks. Elgers (1980) however reports that accounting risk measures do not have ability to predict market based systematic risk.

Other studies also document an association between market risk measures and accounting risk measures, which include financial leverage, size, and growth (Rosenberg & McKibben, 1973; Thompson, 1976). Ryan (1997), in a survey of research relating accounting numbers to systematic equity risk, concludes that the variables that consistently relate to systematic equity risk are earnings variability, sources of operating risk, financial leverage, and operating leverage.

Based on extensive survey literature, Myers (1977) identifies four accounting measures that are related to the measures of market systematic risk (beta). They are the covariance of earnings, earnings variability, financial leverage, and growth (p. 60-64). In addition, Myers asserts that size is also a measure of total risk, i.e. large firms will have lower total risk. Myers also notes that the theory predicting that large firms will have lower systematic risk is not rigorously developed (p. 52). However, this notion is empirically supported by Barry and Brown (1984), among others.

As argued earlier, given that accounting risk measures can proxy for total firm risk and given also that systematic risk and total risk are correlated, accounting risk measures that are related to systematic risk must also relate to unsystematic risk. Thus, it can be argued that accounting variables, in particular accounting risk measures, are potential determinants for the riskiness of a security, and thus a company.

In addition to this, it appears that financial analysts in various countries regard accounting information as potentially useful in explaining the systematic risk of common stocks. This evidence is found in the US (Farrelly et al., 1985), New Zealand (Mear & Firth, 1988), Japan (Ferris et al., 1989; Hall, Hamao, & Harris, 1994), the UK (Arnold and Moizer, 1984; Capstaff, 1991, 1992), and Hong Kong (Selva, 1995). Interestingly, Japanese investors do not heavily rely on accounting information, particularly earnings reports, in assessing the riskiness of certain common stocks (Ferris et al., 1989).

The Indonesian studies also indicate that some accounting variables are significantly related to systematic risk. Tandelilin (1997a, 1997b) examines the association between some accounting variables and the systematic risk of common stocks of Indonesian public firms. He finds six variables, namely long-term debt to total assets, net worth to total assets, the quick ratio, current asset to total assets, firm total assets, and net profit margin, are significantly related to the systematic risk of common stocks. Other studies also find significant relationships between selected accounting ratios and stock prices or stock returns (Purwantoro, 1997; Muharyani, 1998; Prawirohartono, 1998). This empirical finding appears to confirm that accounting information is regarded as value relevant to determine the riskiness of Indonesian securities and thus corporations.

In addition to the above findings, there is a suggestion that a number of selected financial ratios based on the published financial statements of Indonesian public firms

can adequately be used to predict future earnings (Machfoedz, 1994). This finding, *ceteris paribus*, shows that certain accounting variables are informative for investors in the Indonesian capital market and are useful for the valuation of a security suggesting that the systematic risk of Indonesian public corporations is related to financial accounting information.

Despite evidence that accounting numbers are related to the systematic risk of common stock, Harianto and Sudomo (1998) reported that, during the early market boom of 1989, investors' decisions to buy and sell was not affected by the available information. Instead, a speculative, or naïve, behaviour seems to drive investors' decisions (p.322). However, a later report suggests that accounting information is taken into consideration in investors' buy and sell decisions (p.314). This later evidence suggests that accounting information is useful for the valuation of a security.

In summary, it has been shown that accounting information is a potential determinant of the riskiness of a corporation. Among accounting numbers that have consistently been related to company risk are financial leverage, operating leverage, company size, earnings or profitability ratios, and growth. The evidence suggests that earlier studies investigating the relationship between accounting risk measures and total or systematic risk have been mostly based on intuition and are supported by empirical evidence. However, recent theoretical development and empirical evidence has shown that accounting numbers are related to market measures of risk (Ohlson, 1995; Feltham & Ohlson, 1995; Bernard, 1995). Recent empirical studies have also provided evidence that investors could earn abnormal returns by performing fundamental analysis (See for example, Chan et al., 1991; Lev & Thiagarajan, 1994; Chung & Kim, 1994; Ballester &

Livnat, 1997; Setiono & Strong, 1998). Thus, the association between accounting risk measures and market measures of risk has been theoretically and empirically supported.

Recall that the IPO literature has suggested that accounting numbers, such as earnings, sales, and book value, are useful in the pricing and valuation of an IPO (Perez, 1984; Bloch, 1986; Sutton & Benedetto, 1988; Buck, 1990; Benninga & Sarig, 1997). Ryan (1997) notes that in the absence of ex post measures of risk, such as in the case of IPO, the firm's risk is estimated through the use of (mostly current) accounting variables. This asserts the potential role of accounting information in the risk estimation of an IPO. In addition to this, Beaver et al. (1970), Foster (1986), Lev (1989), Berstein and Wild (1998), and Noland and Pelvik (1998) also suggest a possible use of accounting information for the valuation of privately held firms wishing to go public.

Outside investors who do not actively engage in a firm's corporate governance may rely on the issuing firm's financial statements, as in its prospectus, to value their claims because accounting data potentially reflects issuers' proprietary business information. However, the accuracy of accounting information, in particular in the case of an IPO, may be subject to the issuers' incentive to bias the numbers in their best interest.[7] This problem eventually could be reduced by the existing accounting regulations that restrict the issuers' ability to distort financial data. Auditor's verification could also increase the reliability of financial statements (Healy & Palepu, 1993; Palepu, Bernard, & Healy, 1996; White et al., 1998). As financial information available in the issuing firm prospectus must be audited, this makes such information an accountable and reliable source with relevance in reflecting the firm's financial position.

[7] Accounting information of the US IPOs of common stocks has been subject to earnings manipulation (See for example, Friedlan, 1994; Magnan & Cormier, 1997). Aharony, Lin, and Loeb (1993), however, do not

In summary, it is likely that investors, who are engaged in the new issue market, use their judgment by utilising information available in the issue prospectus. The absence of publicly available information about the issuing firms makes information available in the issue prospectus as one potential information source for the valuation of the IPO. The available accounting information, along with the signals shown by the issuers, may serve as a key factor in determining the price and thus the value of an IPO. It also appears that certain accounting variables can be used as a proxy for total firm risk and thus can be used as a surrogate for ex ante uncertainty which accordingly are appropriate for testing the IPOs underpricing equilibrium.

In addition, it has also been known that the level of accuracy of accounting information has been a primary concern for investors in the IPO market. Beatty (1989) provides strong evidence on the notion that investors in the IPO market regard an IPO with more precise information, as it is audited by prestigious auditors, of being related to lower ex ante uncertainty. That is, accounting information is useful in assessment of ex ante uncertainty. Beatty argues that high quality auditors provide more precise audit services allowing market participants to make more precise estimates of the distribution of firm value. Beatty shows that IPOs audited by high quality auditors experience lower underpricing. Beatty's claim is supported by Affleck-Graves et al. (1993), How et al. (1994), and How (1996), amongst others. Michaely and Shaw (1998) also find that the selection of underwriter and auditor is related to the financial performance of the IPO firms. Thus, other things being equal, more prestigious auditors could reduce the ex ante uncertainty. This implies that there is an inverse relation between more precise

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support this evidence. There is also no evidence that issuers of Indonesian IPOs manage their accounting earnings in the periods prior to the offering (Gumanti, 1996).

accounting information and ex ante uncertainty suggesting that accounting numbers supply information about the ex ante uncertainty on an IPO.

Thus, certain accounting numbers appear to be useful for the assessment of the riskiness of a security. Finally, because total risk is positively correlated to ex ante uncertainty, and given accounting risk measures are potential proxies for total firm risk, we can argue that they can be used as proxies for ex ante uncertainty.

3.4 Empirical Research on IPOs

The puzzling phenomenon of the IPO has attracted significant interest among researchers. Even, two well-recognised journals have provided special issues on IPOs (Journal of Financial Economics, Vol. 34, Issue 2, 1993; Financial Management, Spring 1993). Most of the existing research on IPOs examines the cross-sectional differences of initial returns and most are designed to test the theories of underpricing. Other IPO studies include the valuation study, the short and long run performance of IPOs study, and the IPO pricing study. In this section, I will briefly provide reviews of these studies.

Early studies on the valuation of IPOs generally depart from the signalling hypothesis proposed by Leland and Pyle (1977). Leland and Pyle argue that issuers of IPO use the level of ownership they retained as a signal of firm value. Issuers with higher quality future projects are likely to sell a lower portion of their ownership. Some studies provide strong support for this hypothesis. For example, Downes and Heinkel (1982) test Leland and Pyle's model and conclude that firm value is an increasing function of the issuers' ownership retention. Clarkson, Dontoh, Richardson, and Sefcik (1991) document a significant association between ownership retention and the value of IPOs. Furthermore, How and Low (1993), using Australian IPOs, find support for such an

association. However, other studies do not find a significant relationship between the level of ownership retention and the value of the IPOs (Krinsky & Rotenberg, 1989a, 1989b). Thus, the empirical results concerning the association between ownership retention and the value of IPOs are still inconclusive.

Other IPO valuation studies extend their examination beyond the ownership retention with inclusions of other explanatory variables, such us auditor and underwriter prestige and some accounting variables contained in the prospectus. These studies have generally supported the notion that the accounting variables are partly or jointly associated with the value of IPOs (Downes & Heinkel, 1982; Ritter, 1984; Krinsky & Rotenberg, 1989a, 1989b; Clarkson et al., 1991; Keasey & McGuinness, 1992; McGuinness, 1993; How & Low, 1993; Kim et al., 1994). Most of the studies find that the value of the IPOs is significantly related to the level of ownership retention, the level of debt, the quality of underwriters or investment bankers, the proposed use of the proceeds, firm size, excess returns, and accounting earnings. This evidence indicates that some characteristics of IPO firms are value relevant.

Research examining the short and long run performance of IPOs generally finds that, despite the positive initial returns in the short-term, IPO firms tend to perform poorly in the long-term. Ritter (1991), for example, finds that, in the time span of three years, IPO firms covered in his study generated returns of 34.47% compared to companies of similar size and industry of 61.86%. The IPO long-term underperformance has been documented in many other countries, such as the United Kingdom, Germany, and Finland. However, this is not always the case for some other countries. For example, Kim et al. (1995b) report that Korean IPO firms perform better in the long-term (See Loughran et al., 1994, for evidence in other countries). Other studies also examine the

determinants of IPO long-run under-performance (See for example, Lee et al., 1996; Kim et al., 1995b).

Included in the research examining the pricing of IPOs are Kim et al. (1995a) and Klein (1996). Kim et al. and Klein are probably the only studies that explicitly provide direct tests of the pricing of IPOs using information available in the issue prospectus, with reliance more on accounting information. Unlike most IPO studies that use the level of underpricing as the dependent variable, these two studies use the offer price and perform regressions using various variables obtained from the prospectus. Kim et al. and Klein conclude that the IPO firms' financial variables significantly affect the market price of the issue. This finding supports the notion suggested in the literature that accounting information is used as input into the pricing of an IPO.

Most recent IPO studies pay attention more to the first phenomenon of the IPO market; that is, significant underpricing. These studies examine the cross-sectional variance of the level of underpricing and most are designed to test existing underpricing theories. Anderson et al. (1995) and Jenkinson and Ljungqvist (1996) provide comprehensive summaries of studies testing the underpricing equilibrium theories. Nolland and Palvik (1998) also provide a summary and review of the underpricing theories and related studies.

Recall that the underpricing theories suggest that the magnitude of underpricing is positively related to the ex ante uncertainty surrounding the issue. Taking the raw or adjusted initial returns as the dependent variable and regressing over various proxies for ex ante uncertainty, the studies find that some proxies are consistently related to the degree of underpricing. Table 3.3 provides a summary of studies relating initial IPO returns and various proxies for ex ante uncertainty.

Table 3.3

Summary of Studies Relating IPO Initial Returns to Various Proxies for Ex Ante Uncertainty

Study	Offer Size	Firm Size[a]	Owner-ship Level	Firm Age	σ of Return	UW Quality	Auditor Quality	Bank or Debt Dummy	Debt Equity Ratio[b]	Profit[c]	PA/TA[d]	Country	Sample Size (Years)
Logue '73	(-)[b]					Mixed						US	250 (65-69)
Ritter '87					(+)[b]							US	664 (77-82)
Johnson & Miller '88					(+)[c]							US	962 (81-83)
Beatty '89			(+)[c]	(-)[d]								US	2,215 (75-84)
Buckland & Davies '90	(+)[d]									(-)[c]		UK	331 (80-85)
Carter & Manaster '90	(-)			(-)		(-)[c]						US	501 (79-83)
Levis '90	(+)[c]	(+)[c]										British	135(85-88)
Wethyavivorn & Koo-Smith '90	(-)[c]	(-)							(+)			Thailand	32 (88-89)
James & Wier '90	(-)		(-)	(-)[b]		(-)		(-)[b]				US	549 (80-83)
Slovin & Young '90		Mixed	(-)					(-)[b]				US	316 (80-84)
Keasy & Short '92	(+)[b]	(-)[b]	(+)*	(+)						(-)[b]		UK	222 (84-88)
McGuinnes '93						(+)						Hong Kong	92 (80-90)
Garfinkel '93	(-)[b]			(-)[b]		(-)		(-)[b]			(-)	US	549 (80-83)
Affleck-Graves et al. '93	(-)[b]	(+)[b]	(-)	(-)[b]	(+)[b]	(-)[c]	(-)[b]					US	1,078 (83-87)
Kim at al. '93	(-)[c]		Mixed			Mixed			Mixed	(+)[c]		Korea	177 (88-90)

Table 3.3 (continued)

Study	Offer Size	Firm Size[a]	Owner -ship Level	Firm Age	σ of Return	UW Quality	Auditor Quality	Bank or Debt Dummy	Debt Equity Ratio[b]	Profit[c]	PA/TA[d]	Country	Sample Size (Years)
Clarkson '94	(-)	(-)		(-)[c]		(+)	(+)					US	420 (76-85)
How et al. '94	(-)[b]			(-)	(+)[b]		(-)		Mixed			Australia	340 (80-90)
Michaely & Shaw '94	(+)[b]					(+)[b]						US	947 (84-88)
Clarkson & Merkley '94	(-)[c]			(-)	(+)[b]	(-)	(-)					Canada	180 (84-87)
How '96	(-)[b]			(-)[b]	(+)[b]	(-)	Mixed		(+)[c]	(-)		Australia	200 (79-90)
Lee et al. '96a	(-)	(+)	(+)[c]	(-)[c]	(-)							Australia	266 (76-89)
Lee et al. '96b	(-)[c]		(-)[c]	(+)								Singapore	128 (73-92)
Chisty et al. '96	Mixed		Mixed	(+)[c]	(+)[b]	(-)						US	599 (79-84)
Pettway & Kaneko '96		(-)								(-)		Japan	147 (81-93)
Hedge & Miller '96	(+)[c]		(-)[b]	(-)	(+)[b]	(-)[c]	(-)[b]		(-)[b]			US	890 (81-85)
Hameed & Lim '98	(-)		(+)									Singapore	53 (93-95)
Booth & Chua'96	(-)											US	2,151 (77-88)
Michaely & Shaw '98		(-)				(-)[b]			(-)	(-)		US	809 (84-88)
Paudyal et al. '98			(+)		(+)[c]	(+)[c]						Malaysia	79 (84-95)

[b], [c], [d] denote coefficients being significantly different from zero at the one, five, and ten percent levels, respectively.
[a] The measure of firm size usually takes two forms: total assets or sales.
[b] There are various measures for debt to equity ratio.
[c] Profit is measured either as the level of profits or profitability ratios.
[d] PA/TA is the ratio of plant assets to total assets.

Table 3.3 shows some studies that involve accounting variables in their regressions. These accounting variables include the level of debt (financial leverage), profit level or profitability, operating leverage measured as the ratio of plant assets to total assets, and IPO or firm size. The findings are mixed. The other variables most frequently tested are issue size, aftermarket standard deviation, the length of operating history, the prestige of underwriter and auditor, and ownership retention. The issue size appears to be consistently and negatively related to the degree of underpricing, apart from studies by Hedge and Miller (1996) and Buckland and Davies (1990). Aftermarket standard deviation is also consistently positively related to the degree of underpricing. The results for other variables seem to be mixed.

There is a study that examines the cross-sectional variance of the level of underpricing in Indonesian IPOs. Hanafi (1998) tests the relation between the level of underpricing and three variables namely market capitalisation, security return variability, and industry type. A sample of 106 IPO firms from seven industries are examined. Hanafi finds that none of these three variables are significantly related to level of underpricing. Hanafi also considers the effect of the price earning ratio restriction imposed by the market regulator on IPO initial excess return and finds that such a restriction does not have a significant effect. Hanafi goes on to suggest a possible examination of other factors that could be related to the magnitudes of underpricing.

Another study using 119 Indonesian IPOs having initial return greater than zero reveals that the extent of underpricing is negatively related to the offer price and year in operation and positively related to the standard deviation of aftermarket return (Sautma, 1998). Although these two studies do not run a regression analysis, the reported findings,

in particular Sautma, appear to suggest that the extent of underpricing in Indonesian IPOs is somewhat predictable. Thus, the level of significant positive initial return in Indonesian IPO must have been related to certain factors. It is the main purpose of the current study to examine the factors that explain the variation of initial return in Indonesian IPOs.

In summary, empirical studies have supported the notion that certain accounting information available in the issue prospectus could explain the cross-sectional variation of the level of underpricing. This accounting information is also value relevant to the IPO. The evidence also indicates that the actions and/or signals selected by the entrepreneurs can be used to determine the initial returns of the IPOs. This apparently suggests that the initial return or underpricing phenomenon is explainable.

3.5 Research Question

The review in the previous sections can be summarised into three conclusions. First, information disclosed in the prospectus is regarded as a potential source for assessment about the value of the issuing firm. In particular, some financial accounting information has been used, explicitly or implicitly, as input into the pricing of an IPO. Second, there is evidence that IPOs are on average underpriced. The theories proposed to explain the underpricing phenomenon have generated similar implications that the more uncertain the value of the issuing firms (i.e., the greater the ex ante uncertainty) the greater the degree of underpricing. Third, there are a number of potential proxies for ex ante uncertainty that have been used to explain the extent of IPO underpricing. Among the identified proxies, as found in previous studies accounting risk measures appear to be useful as potential proxies for total firm risk and thus ex ante uncertainty, which would make it reasonable to examine them as potential determinants of IPOs initial returns.

The above conclusions lead to the following research question "*Is there an association between accounting variables perceived to be a measure of total firm risk and the magnitudes of underpricing of new issues of common stocks? If so, what factors best determine the underpricing of new issues of common stocks?*".

3.6 Chapter Summary

This chapter has provided a review of the literature. Information disclosed in the prospectus is a potential source for determination about the value of an IPO. The literature suggests that some financial accounting information is value relevant to the IPO and it has empirically been used as an input into the pricing of an IPO.

Empirical studies have found that new issues of unseasoned stock (IPO) are on average underpriced. The level of this positive initial return varies across countries, with a lower level tending to be found in more developed markets, and a higher level in less developed markets. Some theoretical explanations have been advanced to unravel this puzzling phenomenon. The proposed theories generally come to a similar conclusion that the more uncertain the value of the issuing firms (i.e., the greater the ex ante uncertainty) the greater the degree of underpricing.

The current study argues that the total firm risk and the ex ante uncertainty of an IPO are positively correlated, which suggests that total firm risk is a potential proxy for ex ante uncertainty. The review has shown that accounting risk measures are value relevant to the value of an IPO. Given that accounting risk measures are potential proxies for total firm risk, and as total firm risk is positively related to the ex ante uncertainty of an IPO, it is reasonable to argue that accounting risk measures are also potential indicators of ex ante uncertainty. It is the specific purpose of this study to examine the

association between accounting risk measures and the degree of underpricing in the context of a sample of Indonesian companies.

CHAPTER 4

RESEARCH METHODOLOGY

This Chapter presents the study's research methodology and is organised as follows. Section 4.1 describes the selection of the sample and the source and type of the data used in the study. The section also describes the classification of the sample based on both the years of offering and industry. The definition and measurement of each of the variables and hypothesis formulation are presented in Section 4.2. Section 4.3 presents the regression model. The final section summarises the chapter.

4.1 Sample Selection

The sample firms used in this study must satisfy the following basic criteria:

1. The firms must have made an initial public offering during the period 1989-1997.
2. The firms must have an initial public offering on the Jakarta Stock Exchange.
3. The firms must not be in the real estate, property, and construction industry (Code 61-69), the finance and insurance industry (Code 81-89), or an investment company (Code 98).
4. The prospectus of the IPO firms must be available.
5. The firms must not be in an early development stage.
6. The firms must have sufficient trading liquidity after the issue.

The first criterion is applied for two reasons. First, the terminal year of 1989 is imposed because prior to that year the market was not highly regulated and also the market experienced low trading liquidity and high volatility. A number of market

deregulations that were introduced in late 1988 have attracted firms to list on the stock exchange with the first issue occurring in July 1989. Limiting the sample of IPO firms to 1997 should minimise the effects of the economic crisis experienced by Indonesia, which started in the second half of 1997. Only firms listed on the Jakarta Stock Exchange are considered in this study. Most of the firms making an IPO tend to list on the JSX and/or the Surabaya Stock Exchange (SSE). However, some firms list only on the SSE. In addition, the SSE has its own Composite Index, which tends to be lower than that of the JSX, and is also considered to have lower liquidity than the JSX.

The third criterion is employed to obtain a relatively homogenous sample with respect to the state of financial accounting reports. Firms in the real estate, property, and construction industry, the finance and insurance industry, and firms classified as investment companies have significant differences compared to other industries, which in turn may affect their valuation. Such differences include the structure of capital used in their operation. In addition to this, since the main issue analysed in this study is the role of accounting information in determining the magnitudes of underpricing, differences in capital structure and also components of balance sheet and profit and loss statements may affect the calculation and definition of variables.

The fourth criterion is necessary since a large part of the data needed for analysis comes from the issue prospectuses. Firms in the early development stage are excluded because they have unusual sales or assets increases which may affect the performance recorded in financial reports. Each firm must have trading records following their issue and the trading records must be sufficient. This criterion is imposed to allow for sufficient calculation of immediate aftermarket performance as this study examines market response soon after the issue. An IPO firm with low liquidity in its aftermarket

may reflect a low market response and thus could alleviate factors used in the valuation of the issue.

Three sources of data are used for this study: the JSX, the Bisnis Indonesia daily newspaper, and the Datastream Database. Most of the data was collected from the JSX. All of the issue prospectuses were gathered from the Capital Market Reference Centre (Pusat Informasi Pasar Modal or PRPM), a joint unit of the JSX and Bapepam with its main role being a source of public information. PRPM stores and files, amongst other items, firms' prospectuses of new issues or rights offering, daily stock prices, and firm financial reports. However, daily stock price data is not always in the files, especially for data for 1989, 1990, 1991, and 1992. The JSX also provides data electronically, which is available for purchase. Yet, this form of database is only available for the period since September 1992. Although some of the data for daily stock prices prior to 1992 is available, external parties are not allowed to access it because of missing data problems. To obtain the data for daily stock prices for the period prior to 1993, I asked one of the JSX employees to assist me in collecting them after giving a list of the firms. However, there is still some missing data.

To overcome the difficulties in data collection, in particular in relation to stock price data for periods prior to 1993, I utilised the library of Bisnis Indonesia, a daily newspaper which concentrates on business news. The filing and data collection of Bisnis Indonesia are comprehensive and easy to access. Bisnis Indonesia publishes JSX daily stock price movements covering, amongst other things, the opening price, highest and lowest price, and the closing price as well as the volume of transactions. The Bisnis Indonesia newspaper started publication of stock price movements both for the JSX and the SSE in August 1989.

The third source of data used in this study is the Datastream Database. This database provides information on daily stock prices, the volume of transactions, high and low bid prices for the world's major capital markets, including the JSX. The data on stock prices are expressed in adjusted and unadjusted currencies. For example, for the JSX the stock price is expressed in either Indonesian Rupiah or in other major currencies (i.e., British pounds). The database includes data for Indonesian public firms from 2 April 1990 onward. However, some differences are present regarding the starting date of IPOs compared to the data from the JSX and Bisnis Indonesia. This problem is overcome by consistently using the JSX data, as it is the main source of the data of this study.

In order to maintain consistency, the data collected from the JSX and Bisnis Indonesia is crosschecked with the data from the Datastream database. The Datastream database has one potential limitation, in that it does not adjust for Indonesian public holidays in their database, as Indonesian has some differences in its public holidays compared to most western countries. In this case, I carefully examined such possible differences and adjusted where appropriate.

Table 4.1 shows the number of firms remaining after each of the selection criteria was applied. As can be seen in Table 4.1, two hundred and sixty four firms made an IPO during the periods of 1989-1997 (Criterion 1). Of these 264 firms, 86 are those that come from the real estate, property, and construction industries (JSX Code 61-69: 26 firms), the finance and insurance industries (JSX Code 81-89: 54 firms), and investment companies (JSX Code 98: 6 firms). These IPO firms were excluded from the sample (Criterion 2). Four IPO firms were dropped, as their prospectuses were unavailable (Criterion 3). Furthermore, six IPO firms were eliminated from the sample, as they were classified as being in an early development stage (Criterion 4). Two IPO firms were

dropped due to no trading records being available for them (Criterion 5). These two firms were those that went public in July and August 1989. Efforts have been directed to obtain the early trading records of these two firms, yet neither the JSX nor Bisnis Indonesia newspapers have the records. Finally, thirteen more IPO firms were excluded from the sample, as they suffered from insufficient trading liquidity, i.e., they have recorded little, if any, change of hands of the issue stocks in their early stage of public offering (Criterion 6). Furthermore, the prices of these stocks were relatively unchanged leading to low price variability.

Table 4.1

Sample Selection Procedure

Description	# of IPO
Number of firms that made an IPO during the period 1989-1997	264
Firms having JSX Code of 61-69, 81-89, and 98	- 86
Firms not in JSX Code of 61-69, 81-89, and 98	178
Firms with prospectuses which are unavailable	- 4
Firms with available prospectuses	174
Firms in early development stage	- 6
Firms not in early development stage	168
Firms where the trading records are unavailable	- 2
Firms with available trading records	166
Firms having a lack of trading liquidity in the aftermarket	- 13
Potential sample	153
Firms which made a dual listing (3) and made a major restructuring (1)	- 4
Final sample	149

JSX Code 61-69 are for firms in the real estate, property, and construction industry, Code 81-89 are for finance and insurance industry, and Code 98 is for investment company.

The application of the six criteria reduces to a total of one hundred and fifty three IPO firms available for examination. However, closer examination reveals that three firms had made a double listing, that is, they not only listed on the Indonesian domestic stock exchanges, but they also listed on foreign stock exchanges, such as the New York Stock Exchange or the London Stock Exchange. These three IPO firms were then excluded from the sample, as this factor might create significantly different impacts on the demands for the issue and therefore the price. All of this could affect the initial motive of investors in the secondary market. One more firm was dropped from the sample as it had made a major restructuring in the period just before going public. Such action has generated unusual effects on its financial structure and operating performance. Finally, one hundred and forty nine IPO firms satisfied the requirement criteria and have been determined as the final sample.

Table 4.2 shows the industry classifications and the year of IPO for the sample firms. The sample firms examined in this study represent 56.43% of the total number of IPOs made by firms during the period of analysis of 1989-1997. Most of the sample firms come from manufacturing industries (Code 31-39, 41-49, and 51-59) which provided 109 firms or 73.15% of the total number of IPO firms examined. These industries involve basic industries and chemicals (48 firms), miscellaneous industries (35 firms), and consumer goods industries (26 firms). As noted by Husnan (1994), this study also finds that the most frequent IPOs' occurred during the market boom of 1989-1990, with a second boom occurring in 1993-1994. The boom periods (1989, 1990, 1993, and 1994) account for almost two-thirds of the sample firms (64.44%) or 96 firms of the total.

Table 4.2

Industry Classification and Year of IPO of the Sample Firms

Year Code	1989	1990	1991	1992	1993	1994	1995	1996	1997	Total	%
11-19		2				1		2		5	3.36
21-29		1				1	1	1	1	5	3.36
31-39	5	15	5	2	4	8	2	4	3	48	32.21
41-49	2	11	3	4	7	4	1	1	2	35	23.49
51-59	1	6	2	1	3	6	2	4	1	26	17.45
71-79		1				2	1		1	5	3.36
91-99*	4	5	1	3	3	4	3	1	1	25	16.77
Total	12	41	11	10	17	26	10	13	9	149	100.00
%	8.05	27.52	7.38	6.71	11.41	17.45	6.71	8.72	6.04	100.0	
Total IPOs	32	66	17	14	21	47	22	15	30	264	
% of total	37.50	62.12	64.71	71.43	80.95	55.32	45.45	86.67	30.00	56.43	

11-19 for agriculture, 21-29 for mining, 31-39 for basic industry and chemical, 41-49 for miscellaneous industry, 51-59 for consumer goods industry, 71-79 for infrastructure, utility, and transportation, and 91-99 for trade and services.

* This excludes companies in the 98 code, which are investment companies.

4.2 Measurement of Variables and Hypotheses Formulation

4.2.1 Dependent Variables

The dependent variable used in this study is the level of underpricing. This is measured as the difference between the first day's closing price and the offering price divided by the offering price. Other measures of the dependent variable examined are the returns measured in one week, one month, and one year. The adjusted return is measured as the difference between the initial excess return for each IPO and the market returns on the date of the listing of the IPO.

The first hypothesis to be tested is one that relates to the widely found evidence of systematic underpricing of initial share offers. Previous studies of Indonesian IPOs have documented significant underpricing (Husnan, 1991, 1994; Hanafi, 1998; among others). Thus, in relation to the existing evidence of significant underpricing, the following hypothesis is tested (stated in alternative form).

H_1 *Initial public offerings of common stocks are underpriced, on average.*

This study also uses other measures of initial returns. Previous studies have used these different measures of initial returns (See for example, How, 1994). The following are the various measures of the degree of initial returns used in this study. The use of other measures is intended to examine whether the level of initial return is sensitive to the model used to calculate it.

1. $UP_j = (P_{j,t} - P_{j,off}) / P_{j,off.}$
2. $MAUP_j = [(P_{j,t} - P_{j,off}) / P_{j,off}] - [(MI_{jt} - MI_{j,t-1}) / MI_{j,t-1}].$
3. $UPL_j = \ln (P_{j,t} / P_{j,off}).$
4. $UPA5D_j = (P_{j,v} - P_{j,off}) / P_{j,off}.$
5. $UPLA5D_j = \ln [(P_{j,v} / P_{j,off}).$

where P_{jt} is the first day closing price of security j, $P_{j,off}$ is the offering price of security j, MI_{jt} is market index on the issue day of security j, $MI_{j,\,t-1}$ is market index on one day before the issue of security j, $P_{j,v}$ is the average of the first five days prices after the issue, and ln is the natural logarithm.

Some studies find that taking the market return does not alter the findings, especially when the market's returns do not have significantly high volatility. (See for example the discussion in Ritter, 1990).

4.2.2 Independent Variables

It is difficult to precisely select the appropriate accounting risk measures given that no theory explicitly specifies the best ratio or measure for each of the accounting risk measures. Therefore, to avoid or minimise bias in the selection of accounting risk measures some criteria have been imposed. Dhingra (1982) advocates some basic criteria in the selection of accounting ratios used as proxy for total firm risk. These include, firstly, the measure must have pertinence in reflecting the risk characteristics of the firm; secondly, it must have precision in its projected relationship with risk; thirdly, it must capture the important relationship suggested in the literature; fourthly, it is easy to understand by the general investment community; and, finally, it has been frequently used in previous research dealing with risk analysis (to assist comparability). In addition to these five criteria, I also propose three additional criteria: firstly, the ratio or measure must have been suggested in the IPO literature; secondly, if possible, the ratio or measure must have been examined in the Indonesian capital market or in other emerging markets; and thirdly, the selected ratio must be feasible in terms of the data availability.

After considering the above criteria, five accounting risk measures are finally selected and used as proxies for ex ante uncertainty. These accounting risk measures are financial leverage, operating leverage, size, growth, and profit margin. Each of these selected variables will be discussed followed by the hypotheses.

4.2.2.1 Financial Leverage

The finance literature suggests that the variability of firm value is affected by the introduction of debt into its capital structure. When debt is introduced into a firm's capital structure, a more volatile earnings stream results. This will increase the risk of common stocks, which leads the shareholders to demand a higher return (Brealey & Myers, 1996). Early studies by Hamada (1969) and Rubenstein (1973) show that firm risk is a function of financial leverage. Ben-Zion and Shalit (1975) and Christie (1982) also confirm that such a relationship does exist. Dhingra (1982) acknowledges that financial leverage is regarded as one of the predictors of firm risk. Gahlon (1981), Gahlon and Gentry (1982), and Mandelker and Rhee (1984) provide theoretical models, and empirical evidence, that financial leverage is a potential determinant of firm risk. Japanese investors also perceive that leverage is a significant predictor of the systematic risk of common stocks (Ferris, Hiramatsu, & Kimoto, 1990).

Empirical evidence in an IPO setting, however, provides mixed results. Kim et al. (1993) find a significant positive relationship between financial leverage and initial excess returns in a study of Korean IPOs. How et al. (1995) find no significant relationship between financial leverage and the degree of underpricing in their study of Australian IPOs, but using a reduced sample they find a significant positive relationship. In contrast, James and Wier (1990) find that IPOs with a history of a borrowing relationship experience lower underpricing than those without a borrowing relationship. Further, James and Wier posit that ex ante uncertainty is decreasing in a firm's pre-IPO capital structure upon the existence of debt. Slovin and Young (1990) also find that the presence of bank debt and/or lines of credit in the capital structure of a firm prior to IPO

is negatively related to IPO initial returns. Garfinkel (1993) also documents that the existence of debt in a firm's pre-IPO capital structure reduces the level of underpricing.

Unlike James and Wier (1990), Slovin and Young (1990), and Garfinkel (1993), who use a binary variable, Hedge and Miller (1996) use the amount of debt as the variable. Hedge and Miller argue that the existence of debt prior to the offering of an IPO can be used as a signal about the quality of the issue. Their hypothesis is developed on the basis of the financial signalling literature that suggests that one of the primary means used by a high quality firm is debt financing (Leland & Pyle, 1977; Myers & Majluf, 1984). Hedge and Miller argue that issuers of a high quality firm use larger amounts of debt prior to the offering to signal that the firm has high quality prospects. A high quality firm uses debt either to mitigate inefficiencies in its investment decisions or to signal its private information to the market. Hedge and Miller point out that there is a greater probability that outsiders will have the opportunity to detect the firm's ability to service its debt obligations the larger the firm's debt. In other words, pre-IPO debt serves as a proxy for a firm's future prospects. Their finding supports their proposition of a negative and significant association between the level of IPO firms' debt prior to the offering and the degree of underpricing.

The existing mixed findings on the relationship between financial leverage and the degree of underpricing have made it difficult to predict the correlation between them. The current study relies upon its prediction based on the existing findings about the Indonesian stock market, which suggest that debt levels are positively correlated with firm risk (Tandelilin, 1997a, 1997b; Rizka, 1998). In addition to this, Anderson et al. (1996), in a review of the IPO literature, concludes that the degree of underpricing

increases with the level of debt. Thus, this assertion leads to the following hypothesis (stated in its alternate form).

H_2 *The higher the level of IPO firm financial leverage the lower is the degree of underpricing.*

There are three measures of financial leverage examined in this study. First, financial leverage is measured as the ratio of total debt to the sum of debt and post-market value of equity. Total debt is defined as the aggregate amount of debt of the most current year prior to the offering. The post-market value of equity is defined as the initial market value of the issue (i.e., the number of shares outstanding after the issue times the offering price). The other measures of financial leverage are the ratio of total debt to total assets and the ratio of long term debt to total assets.

4.2.2.2 Operating Leverage

There have been a number of suggestions, theoretically and empirically, about the perceived usefulness of operating leverage as a determinant of firm risk (Lev, 1974; Gahlon, 1981; Gahlon & Gentry, 1982; Mandelker & Rhee, 1984; O'Brien & Vanderheiden, 1987, among others). The literature also advocates that operating leverage is a potential determinant of firm risk, as shown by its effect through operating risk (White, et al. 1998).

Lev (1974) finds operating risk, measured as the ratio of fixed operating costs to variable operating costs, is positively associated with total firm risk. Such an association occurs because the increase in the proportion of fixed costs is followed by an increase in volatility of returns. In his study, Lev runs a time-series regression of total costs on

output to estimate operating leverage. The variable cost component of the firm is calculated as being the slope coefficient of the regression on output. Subsequent studies, such as Mandelker and Rhee (1984) and O'Brien and Vanderheiden (1987) use a similar approach to Lev and find a significant relationship. Since information about an IPO, as disclosed in the prospectus, is limited to a maximum of three years of financial statements, Lev's approach is not applicable in an IPO setting. Accordingly, given this data limitation a proxy for operating leverage is required.[8] One potential candidate for the proxy for operating leverage is capital intensity.

Brigham and Gapenski (1991) define capital intensity as "a measure of the amount of assets required per dollar sales" (p. 933). They point out that capital intensity is one of the greatest influences on a firm's external funding requirements.[9] The selection of capital intensity may raise some questions, since it does not capture all of a firm's fixed costs nor does it consider the relative magnitude of fixed and variable costs. Thus, it might be identified as a noisy proxy for operating leverage. However, given the limitations of the data, capital intensity may be the only appropriate surrogate available for operating leverage.

Following Brigham and Gapenski (1991), capital intensity can be expressed as the ratio of sales to total assets (a reciprocal of total assets turnover), which is similar to one of the static measures of operating leverage suggested by O'Brien and Vanderheiden (1987). This ratio suggests the amount of assets required to generate sales. A higher ratio

[8] O'Brien and Vanderheiden (1987) suggest the use of a static proxy. They examine four proxies, namely depreciation to total assets ratio, depreciation to sales ratio, total assets to sales ratio, and fixed assets to total assets. Yet, none of the variables is found to be significant.

[9] Brigham and Gapenski (1991) also note that projected sales growth, initial fixed asset utilization rate (excess capacity situation), profit margin, and dividend policy are identified as other factors influencing a firm's external funding requirement.

means that more assets are required to obtain sales, which could be perceived as the firm having a lower utilisation of its assets. O'Brien and Vanderheiden contend that this ratio may serve better than the other operating leverage proxies (such as fixed to total assets ratio) because it provides a more reasonable gauge of the intensiveness of physical capital relative to labour and raw material. Rosenberg and McKibben (1973) also use this ratio in their study. A higher ratio means that the firm is engaging in low assets intensiveness. Accordingly, a firm with a lower sales to assets ratio is said to be less attractive and thus more risky. Therefore, it is predicted that the higher the ratio, the higher is the level of initial return.

Another measure for capital intensity is the ratio of fixed assets to total assets. Firms with a larger assets base tend to be exposed to more fixed operating costs relative to variable costs, resulting in greater leverage. In addition, firms are more likely to face greater inflexibility if their production technology demands a high proportion of fixed assets. It is usually more difficult for a firm with a heavier fixed asset base to convert to new products and production methods. Also, the earnings of such a firm tend to be unstable, resulting in a greater degree of risk to holders of its securities. Therefore, a positive relation between the ratio of fixed to total assets and risk is predicted.

The selection of these two proxies for operating leverage is subject to some theoretical limitations. For example, two firms with similar fixed to total assets ratio do not always use a similar amount of labour (variable costs), meaning that operating expenses from which the operating leverage is measured will also differ. Also, a firm with low fixed physical assets (for example, a service firm) could have larger current assets and may be exposed to relatively large operating costs in terms of salaries and/or

benefits given its highly skilled staff. This firm could have a large degree of operating leverage and low fixed to total assets ratio.

Empirical studies have paid little, if any, attention to the potential influence of operating leverage as a determinant of IPO initial return. Garfinkel (1993), who uses the ratio of plant assets to total assets, finds a negative, but insignificant, relationship. However, as firms are likely to reduce the capital intensity ratio to obtain external financing, it is expected that a higher capital intensity ratio (i.e., operating leverage) is associated with higher initial returns. This prediction leads to the following hypothesis (stated in alternative form).

H_3 *The higher the level of IPO operating leverage the higher is the degree of underpricing.*

Two measures of operating leverage are examined: the ratio of total assets to sales and the ratio of fixed assets to total assets.

4.2.2.3 Size

Beaver et al. (1970) point out that firm size can be used as a proxy for the total risk of the firm. Ritter (1984) proposes an argument that more established firms (usually larger firms) are less risky than less established ones, because more is known about them and they are easier to value. Using size as proxy for ex ante uncertainty, Ritter provides support for his argument. Barry and Brown (1984) also suggest that there is a positive relationship between firm size and firm specific information. That is, larger IPOs, where

more information is available about them, are more likely to be related to lower risk and thus lower ex ante uncertainty.

Assuming that large firms have a more diversified asset base, then if the value of the assets of the firm are less than perfectly correlated we may expect that larger firms have a lower variance of rate of return than smaller ones. Whittington (1980) suggests that larger firms tend to have a wider spectrum of activities, suggesting that their share prices and returns on equity are relatively more stable. Ben-Zion and Shalit (1975) note that when size is used as a proxy for economies of scale, firms are able to incur lower costs and earn economic rents. Ibbotson et al. (1988; 1994) find IPOs with lower sales prior to the offering are more underpriced than ones with larger sales, and they suggest that sales may be used as proxy for the level of investor's uncertainty regarding the issuing firm.

Although most of the studies find negative relationships, between initial abnormal return and firm or issue size, some still document a positive and significant relationship (for example, Afleck-Garves et al., 1993). Indonesian studies also show mixed findings. For example, Sautma (1998) finds a positive coefficient for sales and a negative coefficient for issue size (gross proceeds), although neither proxy is statistically significant. A similar finding is reported in Rizka (1995).

To summarise, a large number of empirical studies have found an inverse and significant relationship between IPO size and the degree of initial excess returns. Accordingly, it is expected that the degree of underpricing is negatively related to the size of the IPO. Thus, the following hypothesis is proposed (stated in alternative form).

H_4 *The larger the size of the IPO firm the lower is the degree of underpricing.*

Two measures of firm size are examined in this study: sales and the issue size. All are expressed in their natural logarithms.

4.2.2.4 Growth

Fewings (1975) and Turnbull (1977) argue that the growth of a firm (either represented by sales or assets) may reflect a substantial element of business uncertainty. Firms with constant or stable growth are regarded as having less uncertainty and being less risky. These firms are usually those that are able to maintain their business and tend to have a longer operating history. In contrast, firms that experience faster growth (which tend to be young firms) are subject to greater uncertainty and, therefore, are perceived to be more risky. These firms are usually those that are in the early stages of their existence, which is a common characteristic of IPO firms, and tend to experience excessive sales growth. This is in line with Hall and Renner (1988) who note that the success of an IPO usually rests on a sharp increase in sales, suggesting that, *ceteris paribus*, one indication of the success of the operations an entity seeking capital through an IPO is an increase in sales. Therefore, since it can be argued that faster growing firms are more risky, it is expected that, as growth increases, initial return should increase. Investors will demand higher abnormal returns to compensate for the risk they are bearing. Thus, it is expected that as growth increases initial return should increase. This prediction leads to the following hypothesis (stated in alternative form).

H_5 *The higher the growth of the IPO firm the higher is the degree of underpricing.*

Two measures of growth are used in this study: growth of sales, and growth of total assets. Growth of sales is defined as [(sales $_t$ – sales $_{t-1}$) / sales $_{t-1}$]. The growth of total assets is measured in similar fashion to the growth of sales.

4.2.2.5 Profitability

The level of profitability is examined because an investor's judgments about the effectiveness of business operations may be determined by past profitability. It is argued that high profitability may reduce ex ante uncertainty since highly profitable IPOs may alleviate investors' concern about the effectiveness of management. Krinsky and Rotenberg (1989a) also contend that the profitability of existing operations may provide outsiders with evidence of management effectiveness, and a high profit margin may reduce concerns over the historical level of management shirking or perquisites consumption.

Profitability has been regarded as a potential proxy for the riskiness of an IPO (Beatty & Zajac, 1995). It is also not uncommon that a profitable IPO firm is more attractive than a less profitable one. An IPO firm with a negative profit is regarded as being exposed to greater risk that one with a positive profit. This suggests that an inverse relationship exists between profitability and risk in an IPO setting.

The regulators of Indonesian IPOs appear to be concerned with level of profitability. One of the common stock listing requirement requires that firms wishing to make an IPO must have posted operating profits in the last two fiscal years of operation (Refer to Table 2.2). Thus, it seems that profitability is considered crucial in Indonesian

IPOs. However, as has been stated in the requirement, an IPO firm may not be required to have posted a profit when it has just started the business.

In addition, it has been widely recognised that earnings have information content, that is, accounting earnings supply information for stock price valuation. Kaplan (1978) and Watts and Zimmerman (1986), based on their review, conclude that accounting earnings, from the efficient market hypothesis's point of view, reflect factors that affect stock prices. Thus, earnings or earnings levels are useful for stock price assessment. Earnings have also been used as a standard input in the valuation of IPOs (Perez, 1984; Bloch, 1986; Sutton & Benedetto, 1988; Buck, 1990; Benninga & Sarig, 1997, amongst others). This suggests that earnings are one of the potential determinants of an IPO issue price.[10]

Sterling (1987) points out that one of the key factors to the success of an IPO is that the issuing firm must have a good quality of earnings. Hall and Renner (1988) also assert that the success of IPOs usually rests on earnings trends. Empirical evidence, however, provides mixed findings. Buckland and Davies (1989), as cited in Keasey and McGuinnes (1992), and Keasey and Short (1992) find that the issue price discount is inversely related to the IPO firm's past profits. There is another study that does not provide strong support for the view that profitability is associated with initial abnormal returns in the new issues market (Kim et al., 1993). Kim et al. find a negative but insignificant association between profitability and IPO initial returns in their study of Korean IPOs. In contrast to Kim et al., Pettway and Kaneko (1996) find a positive but

[10] Aggarwal and Rivoli (1991) find that firms with low or negative income tend to exhibit higher issuance costs. These issues are more likely to be marginally undersubscribed, which will increase the risk faced by the investment banker. Thus, IPO firms having low or negative income, and thus earnings, are perceived to be more risky than those with positive income.

insignificant relationship in their study of Japanese IPOs. Michaely and Shaw (1998) also report a similar finding.

As IPO firms with (greater) profitability are perceived to have been better able to manage their business, and thus have exhibited lower risk, it is expected that more profitable IPOs experience lower initial returns. This expectation leads to the following hypothesis (stated in alternative form).

H_6 *The higher the level of IPO firm profitability the lower is the degree of underpricing.*

Three measures of profitability are used in this study: net operating profit ratio (profit before extraordinary items), net profit margin ratio, and return on assets.

Five other variables are included as control variables, namely ownership retention, underwriter quality, operating history, the IPO's standard deviation of returns to the tenth trading day excluding the first day return, and the state of the market. Some other alternative independent variables are also considered depending on the possibility of further analysis. Such possibilities include the length of time to listing.

4.2.2.6 Underwriter Quality

Titman and Trueman (1986) analytically demonstrate that the quality of auditors can be used as a signal of the quality of information in the valuation of newly issued shares. Higher quality auditors are associated with the quality of the services and thus more accurate information which leads to a more precise estimate of firm value. By choosing a higher quality auditor, entrepreneurs can credibly signal private information.

Thus, ex ante uncertainty decreases when higher quality auditors are engaged. Balvers et al. (1988) and Beatty (1989), among others, provide evidence that IPO firms engaging a higher quality auditor experience less underpricing than those engaging a lower quality auditor.

Titman and Trueman (1986) assert that their model can be analogously extended to the quality of underwriter with the same implications of a negative relationship with the extent of IPO initial abnormal returns. The intuition behind this proposition is that higher quality underwriters will attempt to maintain their capital by offering only low risk IPOs. Their special access to the issuing firm allows them to detect which firm is a low or high risk IPO. In addition, higher quality IPO firms will select high quality underwriters in an attempt to signal their quality. Since underpricing is detrimental to the issuing firm, selecting a high quality underwriter is expected to reduce the extent of underpricing.

An early study by Logue (1973) finds mixed results. Subsequent studies, following Titman and Trueman's (1986) proposition, find support for a negative relationship between the quality of underwriter and initial return (Balvers et al., 1988; Johnson & Miller, 1988). A more refined model using ranking qualification proposed by Carter and Manaster (1990) shows support for a negative association between underwriter (investment banker) reputation and the degree of underpricing. Subsequent studies, either using dummy or rank variables, support Carter and Manaster's claim (Affleck-Graves et a., 1993; Kim et al., 1993; How et al., 1995).

An Indonesian study also finds a negative and significant relationship between the quality of underwriter and the extent of underpricing (Rizka, 1995). Rizka uses a dummy variable in differentiating between high and low underwriter quality. An underwriter is assigned as having high quality if he falls in the first tier of those that have been engaging

as lead underwriter of an IPO (solely or jointly) at least ten times. An underwriter that does not fall into this tier is determined as a low quality one.

The above evidence leads to the expectation that a higher quality underwriter reduces ex ante uncertainty and thus is associated with lower initial returns. This expectation leads to the following hypothesis (stated in alternative form).

H_7 *The higher the reputation of underwriters the lower is the degree of underpricing.*

Following Rizka (1995), in the current study the quality of underwriters is determined based on the frequency of their appearance as lead underwriter. The proxy for underwriter quality is determined by classifying an underwriter as having high quality if it has been as lead underwriter at least ten times. A dummy variable is used to differentiate the prestige of an underwriter, that is a higher quality underwriter is coded one, or zero otherwise.[11]

4.2.2.7 Ownership Retention

Leland and Pyle (1977) have demonstrated that the percentage of shares retained by the entrepreneurs making an IPO can convey information about the quality of the IPO. They argue that the greater the percentage of ownership held by the vendors the higher

[11] This study also considers the role of auditor reputation in reducing the degree of underpricing. However, Gumanti (1996) finds that more than 90% of the Indonesian IPO firms are audited by Indonesian auditors affiliated with one of the Big Six accounting firms. This suggests that differentiating the prestige of the auditor between the Big Six and non-Big Six in Indonesian IPO market seems to be inappropriate.

the quality of the IPO. In other words, ownership retention could serve as a signal of information about the future prospects of the firm. Note that the Leland and Pyle model does not directly predict that the level of ownership retention is a signal of IPO initial returns. In this respect, Grinblatt and Hwang (1989), Allen and Faulhaber (1989), and Welch (1989) actually demonstrate that the degree of underpricing is used as a signal of IPO quality through the level of ownership retained by the initial owners. They argue that a high quality firm uses the degree of underpricing as a means of obtaining a greater price in the subsequent offerings.

Ownership retention is usually measured as the ratio of shares held by the initial owners (issuers) after the issue. Empirical evidence finds a positive and significant relationship between the level of ownership retained by the issuers and the degree of underpricing (Clarkson et al., 1991; How & Low, 1993; Lee et al., 1996, Hedge & Miller, 1996, among others). Thus, consistent with previous studies, a positive relationship between ownership retention and the degree of underpricing is expected. This prediction leads to the following hypothesis (stated in alternative form).

H_8 *The higher the proportion of retained ownership the higher is the degree of underpricing.*

Ownership retention is measured as the portion of shares held by original owners after the issue.

4.2.2.8 Operating History

Ritter (1984) suggests that a firm's age is a good proxy for the difficulty of firm valuation. Younger firms have less operating history and, therefore, less information

available, making them difficult to assess. In contrast, older firms appear to provide better information, and have also shown their ability to survive. So, younger firms are more likely to be riskier than older ones. This suggests that it might be more difficult to assess younger firms than older ones. Ibbotson et al. (1988) assert that a more established IPO reduces investor uncertainty about the firm's real value which lowers the degree of underpricing. In addition, Barry, Muscarella, and Vetsuypens (1991) find that the operating history of the firm is negatively related to ex ante uncertainty. Beatty (1989) argues that a longer operating history may provide market participants with better information about managerial production-investment decisions. This may provide a better knowledge of the past performance of the issuing firms. Accordingly, this additional information may reduce investors' estimation of ex ante uncertainty.

Beatty (1989) finds a significant negative association between initial returns and a firm's age suggesting that a longer operating history is associated with lower ex ante uncertainty and thus lower initial returns. This negative and significant finding is supported by many of the following studies (Clarkson, 1994; Lee et al., 1996b; Young & Zaima, 1994; Loughran et al., 1994, amongst others). In addition, the age of the IPO is considered to be in the top hierarchy related to the uncertainty of the IPO (Clarkson, 1994).

Given that ex ante uncertainty is reduced when more information about the IPO firm is available, it is expected that IPO firms with longer operating history will be less underpriced than those with shorter history of operation. This prediction leads to the following hypothesis (stated in alternative form).

H_9 *The longer the IPO firm's operating history the lower is the degree of underpricing.*

IPO operating history is measured as the difference between the years of operation and the IPO years. The natural logarithm of the number of years in operation is used as the measure of age variable.

4.2.2.9 Ex Post Uncertainty

The standard deviation of daily aftermarket returns subsequent to the issue is included as proxy for ex post uncertainty. This proxy provides an examination of observable firm risk, that is, the measure of the risk level of the IPOs. Ritter (1984) suggests that higher volatility in stock prices is more likely to be related to firms with high uncertainty before public trading began. Greater variability of the daily returns subsequent to the first day's trading can be interpreted as evidence of the existence of greater uncertainty concerning the issue. This means that IPOs with high variance experience greater uncertainty about their offerings. Thus, the aftermarket standard deviation of daily returns reflects the market response to the issue.[12]

Previous studies provide mixed results on the significance of the relationship between the degree of underpricing and ex post standard deviation of returns. Logue (1973), Clarkson (1994), and Lee et al. (1996) do not find a significant relationship. However, Johnson and Miller (1988), Wolfe and Cooperman (1990), Affleck-Graves et

[12] Johnson and Miller (1988) point out that the inclusion of after market standard deviation will diminish the explanatory power of underwriter reputation in explaining the cross-sectional variance of initial returns. This happens in the situation when the knowledge of an underwriter reputation will not increase the explanation of the level of underpricing once the uncertainty variable is taken into account, assuming that the greater the ex ante uncertainty about the issue the greater the underpricing will be. Chishty et al. (1996) find support that such inclusion reduces the explanatory power of underwriter reputation.

al. (1993), and Chishty et al. (1996) find a significant positive relationship. These studies obviously use different measures of standard deviation. For example, Clarkson uses the standard deviation over the 59 trading days subsequent to the first day trading, Lee et al. use the standard deviation of monthly returns, Wolfe and Cooperman use the first 100 trading days, and Miller and Reilly (1987) use the first five trading days.

Indonesian studies also find positive and significant relationships between the aftermarket standard deviation of return and the degree of underpricing (Rizka, 1995; Sautma, 1998). Another study, however, does not find a significant relationship (Indrajati, 1997). Both Rizka and Indrajati use the tenth day's aftermarket standard deviation excluding the first day return, but their sample size is different.

Given the above evidence and theoretical explanation, it is expected that greater variability in the aftermarket is associated with a greater degree of underpricing. Thus, a positive relationship is expected between the daily standard deviation in the early after market and the initial returns. This prediction leads to the following hypothesis (stated in alternative form).

H_{10} *The higher the standard deviation of aftermarket return of the IPO firm the higher is the degree of underpricing.*

Considering that not all of the IPOs examined in this study have complete trading records following its IPO (i.e., lower liquidity) the standard deviation of the daily return over ten days after the IPO excluding the first day return is used in this study, which is consistent with Rizka (1995) and Indrajati (1997). However, it appears that it is at the discretion of the researcher to select the time frame in measuring the aftermarket standard deviation. Thus, another measure might also be used.

4.2.2.10 Market Condition

Logue (1973) is probably the first to have considered the effect of market condition on the extent of IPO underpricing. Early support of Logue's finding is provided in Ritter (1984). Ritter documents the existence of the hot issues phenomenon in which firms that went public during the hot market, a market with heavy IPOs, tend to be underpriced more than those that went public in other periods. Subsequent studies looking at this relationship find consistent support. For example, How (1996), in a study of Australian industrial IPOs, finds a positive and significant relationship between the state of the market and the degree of underpricing.

Husnan (1991, 1994) finds that IPO firms that went public during market booms are more underpriced than those that went public in other periods. This finding suggests that a positive relationship between the aftermarket standard deviation and the degree of underpricing. Thus, consistent with previous studies, it is predicted that a firm that went public in the periods when more firms were making an IPO, will be underpriced more than firms that went public in other periods. This prediction leads to the following hypothesis (stated in alternative form).

$\mathbf{H_{11}}$ *IPO firms going public during a bullish market will be underpriced more than those going public during a bearish one.*

The years perceived to have more IPOs are 1989, 1990, 1993, and 1994 (Husnan, 1994; Winarto, 1997). Thus, these periods are regarded as booms (bullish), whilst the other periods are regarded as bearish. An IPO firm will be assigned the value of one if it went public during the boom periods and zero otherwise.

4.3 Regression Model

Multivariate and univariate analysis will be used to test the hypotheses. The multivariate model applying ordinary least square (OLS) regression is as follows:

$$UP_j = \alpha_0 + \underset{(-)}{\alpha_1 FL_j} + \underset{(+)}{\alpha_2 OL_j} + \underset{(-)}{\alpha_3 Size_j} + \underset{(+)}{\alpha_4 Gro_j} + \underset{(-)}{\alpha_5 Prof_j} + \underset{(-)}{\alpha_6 UWQ_j} + \underset{(+)}{\alpha_7 Own_j} +$$

$$\underset{(-)}{\alpha_8 Age_j} + \underset{(+)}{\alpha_9 SDR_j} + \underset{(+)}{\alpha_{10} MC_j} + u_j \qquad (4.1)$$

where UP is the level of underpricing, FL is financial leverage, OL is operating leverage, Size is the size of the issue, Gro is growth, PM is profit margin as a measure of profitability, UWQ is underwriter quality (an underwriter is assigned as having high quality if he falls in the first tier of those that have been engaging as lead underwriter of an IPO (solely or jointly) at least ten times. An underwriter that does not fall into this tier is determined as a low quality one), Own is ownership retention, Age is the the natural logarithm of the number of years in operation which is used as the measure of the IPOs' age variable, SD is the standard deviation of aftermarket returns, and MC is the market condition. (The years perceived to have more IPOs are 1989, 1990, 1993, and 1994 (Husnan, 1994; Winarto, 1997). Thus, these periods are regarded as booms (bullish), whilst the other periods are regarded as bearish. An IPO firm will be assigned the value of one if it went public during the boom periods and zero otherwise).The descriptions of each of the variables are presented in Table 4.3 along with the predicted sign of the association between these variables and underpricing.

As an additional analysis, I will also examine whether information available in the issue prospectus is value relevant to the IPO as previously examined in Kim et al.

(1995a) and Klein (1996). Thus, the tests are intended to test the external validity of these studies. The results of the test are expected to strengthen the findings reported in the multivariate analyses and shed light on the value relevance of accounting information in the pricing of an IPO. Next, I briefly review these two studies. Klein's study is presented first followed by Kim et al. (1995a).[13]

Table 4.3

The Definition of Variables and Their Expected Relationship

Variables (Abbreviation)	Measurement	Expected Coefficient
Dependent		
Underpricing (UP)	$UP_j = (P_{jt} - P_{j,off}) / P_{j,off}$	
Independent		
Financial Leverage (FL)	1. total debt / (total assets + initial market value of equity) 2. total debt / total assets 3. long term debt / total assets	-
Operating Leverage (OL)	1. total assets / sales 2. fixed assets / total assets	+
SIZE (SIZE)	1. natural logarithm of sales 2. natural logarithm of gross proceeds	-
Growth (GRO)	1. $(sales_t - sales_{t-1}) / sales_{t-1}$ 2. $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$	+
Profitability (PRO)	1. operating profit / sales 2. net income after tax / sales 3. net income after tax / total assets	-
Underwriter quality (UW)	High quality underwriter is assigned 1 and 0 otherwise	-
Retained ownership (OWN)	The portion of shares held by the issuer after the issue	+

[13] Although Kim et al. (1995a) study was published earlier than Klein (1996), their work was based on Klein's working paper. Thus, Klein's paper is the first study on pricing the IPO.

Operating history (LAge)	Natural logarithm of year in operation	-
Standard deviation (SDR)	The daily standard deviation from the second day of trading to the tenth day after the issue.	+
Market condition (MC)	Score 1 for firm making an IPO during bullish market and 0 otherwise	+

All measures are collected from the issue prospectus, except for the standard deviation of aftermarket return.

Klein (1996) argues that the limited information available about the issuing firm in an IPO has made information contained in the issue prospectus a potential source of firm-specific information in the estimation of future growth and risk of the firm. Therefore, the prospectus, which is an audited document publicly available to outsiders, represents further assurance of the accountability of information since misleading information could lead to punishment or legal lawsuits. Departing from the Miller and Modigliani framework, Klein develops a testable model expressing equity value as a function of accounting earnings, book value of equity, expected earnings growth variables, and market or firm-specific risk factors. The IPO offer price is used to represent equity value.

Unlike seasoned equities where the proxies for risk variables are easily identified, for most IPOs these proxies are unavailable, given the limited data and short operating history. One potential source available is the firm prospectus. Thus, risk proxies must be obtained from the prospectus. Klein (1996) uses the level of ownership retention as the proxy for the firm-specific variable. The identity of the firm's auditor and underwriter is used as the proxy for firm-specific growth and risk variables. Three risk proxies are used by Klein, with a dummy variable being given to each of the proxies. The first risk proxy

is whether a risk warning is presented in the cover of the prospectus, where a value of one is given for the presence of warning, and zero otherwise. The second risk proxy is the age of the firm, where a value of one is given if the firm presents the operating history for three or more full fiscal years in the prospectus, and zero otherwise. The final risk proxy is whether warrants are issued, where a value of one is given for a firm offering stock only, and zero if the firm offers a combination of stocks and warrants. The firm's pre-offering earnings per share, the pro forma book value of equity per share, and the net proceeds of the issue are used as proxies for accounting variables. Finally, the Nasdaq composite index is used as the proxy for the market factor and industry factor and is included to seek the effect of industry membership. The dependent variable is the issue price.

A sample of 193 US IPOs is examined alongside 40 IPOs as the holdout sample. Klein (1996) finds support for the proposition that the prospectus provides value-relevant information about the IPO. More specifically, Klein finds that the firm's offering price and aftermarket price are positively related to earnings per share, book value of equity per share, the level of ownership retention, underwriter quality, and the issue proceeds. The display of the risk explicit reference on the issue prospectus is negatively related to the price. The model explains 62% of the variation of the issue price and 44% of the market price. The finding of a significant relationship between offer price and accounting variables is interesting given that existing IPO studies have largely ignored such possibilities, with attention placed on the cross-sectional variance of IPO initial returns. Klein's study also provides further support for the literature that accounting variables are value relevant about the IPO. To test the robustness of the model, Klein applies the

model to 40 IPO firms and finds that the model is successful in predicting initial and aftermarket prices.

Kim et al. (1995a) test the external validity of Klein's model using Korean IPOs. A modification is advanced to capture institutional differences between Korean and US markets. They propose two models: (1) the benchmark model, and (2) the augmented model. The benchmark model consists of four variables, namely earnings per share, issue size, industry index, and the type of offer. Three signalling variables are added to the augmented model. The models are tested on a sample of 147 Korean IPOs that went public between June 1985 and March 1990. The tests are run on two groups of IPOs: those that went public before (labelled BEFORE) and after (labelled AFTER) the IPO price liberalisation which took place on 25 June 1988. The models explain about 40% of the variation of the pricing of Korean IPOs. The issue prices are significantly related to earnings per share, the industry index, and issue proceeds. On the other hand, none of the signalling variables is significantly related to the IPO price.

Similar to Klein (1996), Kim et al. (1995a) also test the predictive ability of the models using hold-out samples. The models are tested on sixteen IPOs of the BEFORE group and thirty-six IPOs of the AFTER group. The results show that the models appear to be able to predict the market price of the holdout samples as indicated by a relatively high degree of correlation between the actual and predicted prices.

The findings reported in Klein (1996) and Kim et al. (1995a) provide further support to the contention that accounting information is impounded in the determination of IPO issue price and is value relevant about the IPO. Thus, the main objective of this additional analysis is to test the external validity of the assertion that accounting information is value relevant to the Indonesian IPO market.

Similar to Kim et al. (1995a), some modifications are needed to test Klein's (1996) model, as not all the variables examined by Klein are available in the current study. For example, it is uncommon for Indonesian IPO to provide specific warnings about risk on the front cover of the prospectus. Also, none of the IPOs provide an audited financial report of more than three fiscal years in their prospectuses. Most of the prospectuses in 1989 and 1990 consist only of the last two years of audited financial reports. Given this firm-specific difference, I use the natural logarithm of firm age, natural logarithm of gross proceeds, and the firm financial leverage (measured as the ratio of total debt to total assets plus the equity initial market value) as the measures for firm risks. A combination of stock and warrants is almost non-existent in Indonesian IPOs. Therefore, this variable is not examined in the current study. The auditor variable is not examined as more than 90% of the sample firms are audited by prestigious auditors (Refer to Footnote 11). The other explanatory variables are earnings per share, and price to book value of equity. The model used to test the pricing of IPOs is as follows:

$$LP_j = a_0 + a_1LEPS_j + a_2PBV_j + a_3LGP_j + a_4FL_j + a_5UWQ_j + a_6OWN_j + a_7LAGE_j + \alpha_8IND_j + u_j \quad (4.2)$$
$$\qquad\qquad (+) \quad (+) \quad (+) \quad (-) \quad (+) \quad (+) \quad (+) \quad (?)$$

where LP is either offer price or market closing price of week one and both are expressed in natural logarithm, LEPS is natural logarithm of earnings per share, PBV is price to book value of equity, GP is gross proceeds, UWQ is underwriter quality, FL is financial leverage, OWN is the level of ownership retention, Age is the IPOs' operation in years, and IND is industry membership. Definitions of variables used in the regression are presented in Table 4.4.

4.4 Chapter Summary

This chapter has provided an account of the study's research methodology. It presented the sample selection criteria. It also elaborated upon the definitions, as well as the measurement, of variables. The Chapter presented the hypotheses to be tested and outlined the regression model. The Chapter also provided the model for the additional test which is the test of the pricing of the IPOs. The findings of the study are presented in the next Chapter.

Table 4.4

Definitions of Variables and Expected Coefficients for Regression Model of the Pricing of IPOs

Variable	Definition	Notation	Expected Sign
Dependent Variable			
1. Offer price	Natural logarithm of the offer price.	LPR	
2. Market price	Natural logarithm of the market closing price of week one.	LPW	
Independent Variables			
EPS	Pre-offering earning per share for the latest fiscal year, expressed in natural logarithm.	LEPS	+
BV of Equity [a]	Post-offering book value of equity per share.	PBV	+
Level of Ownership	Percent of equity retained by the initial issuers.	OWN	+
Underwriter Quality	Dummy variable, score 1 is given if the issue is underwritten by prestigious underwriter and 0 otherwise.	UW	+
Risk	1. Gross proceeds from the issue, expressed in natural logarithm.	LGP	+
	2. Age, the firm years in operation, expressed in natural logarithm.	LAGE	+
	3. Financial leverage, measured as the ratio of total debt to total assets plus initial market value of equity.	FL	-
Industry Membership	The value according to the firm's industry classification.	IND	?

[a] Post-offering book value of equity per share is measured as the ratio of offer price to book value of equity per share.

CHAPTER 5

EMPIRICAL RESULTS

This chapter reports the results of the empirical tests. Section 5.1 provides a general profile of the sample and the descriptive statistics of continuous variables partitioned on the basis of industry classification and year of offering. The section also presents the findings of various measures of underpricing as well as the aftermarket returns. Section 5.2 presents the preliminary results of the analysis of the relationship between initial returns and the variables. The results of univariate tests are outlined in Section 5.3. Section 5.4 provides the results of multivariate analyses and the tests of the hypotheses. The multicollinearity diagnoses are provided in Section 5.5 followed by sensitivity analysis, while discussions of the findings are set up in Section 5.7. Section 5.8 provides additional analyses, which comprise two tests: tests of the model on two states of the market and tests of the pricing of IPOs. The final section summarises the chapter.

5.1 General Profile and Descriptive Statistics of the Sample

Panel A of Table 5.1 provides the general profiles of the full 149 sample firms. The mean and median of sales for the most recent year (twelve months) are Rp. 106.66 billion and Rp. 59.01 billion, respectively. The sales range from Rp. 2.82 to Rp. 1,363.85 billion with a standard deviation of Rp. 165.09 billion. The mean of total assets of Rp. 141.44 billion is significantly higher than the mean of sales ($p < .10$).

The mean offering price of the sample firms is Rp. 5,336.4. A deeper examination reveals that the offering price during the early market boom (i.e., 1989 and 1990) is significantly higher ($p < .001$) than for the subsequent periods (1991 to 1997). The mean and median offering prices are Rp. 8,850 and Rp. 8,550 for the years 1989-1990, compared to Rp. 3,554 and Rp. 3,200 for the years 1991-1997. The mean offering price for all IPOs made during 1989-1997 is Rp. 5,234.1 (Panel B of Table 5.1), which is insignificantly different from the mean offering price of the sample firms ($t= 0.278$, $p < .390$).

The sample firms examined in this study offer on average of 23.01 million shares, with a minimum number of shares offered of 0.53 million and a maximum number of 430.77 million. The mean number of shares offered for the sample firms is lower than the mean of all IPO firms during the periods of examination of 38.05 million (Panel B of Table 5.1). A similar patter is shown for the amount of proceeds from the issue. The mean gross proceeds for the sample firms is 75.64 million. The figure stands at 91.96 million for all IPOs.

The mean and median ages of the firms in this study (i.e., the years in operation) are 16.41 years and 16.00 years, respectively, suggesting that the sample firms have been in existence for quite a long time. The years in operation range from 4 years to 79 years, with a standard deviation of 10.36 years.

The descriptive statistics for the continuous variables examined in this study are presented in Table 5.2. For all of the accounting ratios, the values are based on the firms' most recent financial data available in the prospectus. The sample firms have a mean (median) of financial leverage (measured as total debt divided by total assets plus the

initial market value of equity) of 40.08% (39.60%). The mean values for the second and third measures of financial leverage are 63.44% and 237.23%, respectively.

Table 5.1

General Profiles of the Sample Firms (n=149)
and All IPOs that Went Public in the Periods of Examination (n=264)

Description	Mean	Median	S.Dev.	Min.	Max.
Panel A: Sample Firms (n=149)					
Sales (bill)	106.66	59.01	165.09	2.82	1,363.85
Total assets (bill)	141.44	70.19	200.91	2.48	1,346.16
Offering price	5,336.4	4,750.0	3,287.6	650	17,250
Shares (mill)	23.01	10.00	44.96	0.53	430.77
Gross proceeds (bill)	75.64	40.00	119.39	3.41	898.32
Age (year)	16.41	16.00	10.36	3.00	79.00
Panel B: All IPOs Made in 1989-1997 (n=264)					
Offering price	5,234.1	4,500.0	4,063.9	500	41,300.0
Shares (mill)	38.05	10.75	102.45	0.53	1,085.03
Gross proceeds (bill)	91.96	45.17	173.18	1.28	1,913.33
Age (year)	16.11	14.00	11.10	1.00	79.00

Sales and total assets are recorded based on the firms' most current year available in the prospectus. Age is measured as the firms' years in operation.
Amounts are expressed in Indonesian Rupiah, except for number of shares and age.

The mean total assets to sales ratio (OL1), as a measure of operating leverage, for the sample firms is 159.25%. There appears to be a high degree of variance in OL1. A close check reveals that one IPO firm has an extreme value of 2,106.68%, which could be a potential candidate for being an outlier (The sensitivity analysis presented in Section 5.6 confirms that this observation is influential). The exclusion of this firm reduces the

mean OL1 to 146.10%, with a maximum value of 610.66%. The ratio of fixed assets to total assets (OL2) has a mean value of 35.80%, which is considerably lower than OL1.

Table 5.2

Descriptive Statistics of Continuous Variables (n=149)

FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 total assets / sales; OL2 fixed assets / total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as ($sales_t$ – $sales_{t-1}$) / $sales_{t-1}$; GRO2 is measured as (total $assets_t$ – total $assets_{t-1}$) / total $assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition.

Description	Mean	Median	S.Dev.	Min.	Max.
FL1 (%)	40.08	39.60	15.80	3.35	73.70
FL2 (%)	63.44	66.17	16.78	5.25	93.94
FL3 (%)	237.23	200.00	168.95	5.54	997.79
OL1 (%)	159.25	115.71	186.65	28.02	2,106.7
OL2 (%)	35.80	34.38	19.83	0.23	84.74
GRO1 (%)	41.42	31.38	48.78	-29.43	395.23
GRO2 (%)	50.75	33.53	57.81	-19.30	372.87
PRO1 (%)	17.59	15.95	7.82	-4.34	50.78
PRO2 (%)	9.61	7.80	7.82	0.16	43.83
PRO3 (%)	6.95	6.26	4.87	0.12	27.01
SIZE1	24.63	24.62	1.29	19.52	28.79
SIZE2	24.53	24.48	1.23	21.95	28.50
OWN (%)	76.53	76.90	8.84	30.00	96.20
LAGE	2.65	2.77	0.55	1.09	4.37
SDR	2.66	2.07	2.10	0.17	11.92
UWQ	0.78	1.0	0.03	0.0	1.0
MC	0.64	1.0	0.04	0.0	1.0

On average, the sample firms examined in this study recorded a sales growth of 41.42%. The sales growth ranges from –29.43% to 395.23%. Eight firms recorded negative sales growth. The average growth of total assets of 50.75% is slightly higher than the average growth of sales, which is significantly different at the 10% level. The growth of total assets ranges from -19.30% to 372.87%. Twelve firms had negative assets growth.

It is difficult to predict the effect of negative growth on ex ante uncertainty. One may argue that negative growth may be associated with a greater risk of default or bankruptcy. Thus, firms with negative growth are more likely to get exposed to greater risk. However, firms with positive and higher growth are also associated with greater risk. Thus, it is difficult to assert the relationship between negative growth and ex ante uncertainty (the degree of underpricing). One way of overcoming the confounding effect of negative growth on ex ante uncertainty is by assigning a value of zero for firms with negative growth. Yet, a qualitatively similar result is obtained as indicated by the correlation coefficient. That is, prior to assigning zero for negative sales (total assets) growth, the correlation between sales (total assets) growth and the degree of underpricing is –4.49% (-12.42%), whilst after the change the correlation is -4.87% (-12.29%). Other ways to mitigate the effects of negative growth on the regression estimates are (1) using absolute values as replacement for negative values, and (2) omitting the firms with negative growth. The second option is less desirable as it reduces the sample size. Yet, application of the first alternative does not qualitatively change the correlation coefficient between growth measures and the degree of underpricing. A discussion of the sensitivity tests is provided in Section 5.6.

The mean of the firms' profitability ratios is 17.59% when profitability is measured as operating profit margin (the ratio of profit before extraordinary items to sales). When profitability is measured as net profit margin (the ratio of net income after tax to sales) the figure has a mean value of 9.61%. The mean profitability ratio is 6.95%, when profitability is measured as the ratio of net income after tax to total assets. None of the sample firms examined in this study had negative profits in their last fiscal year of operation prior to going public.

The mean and median of the number of shares held by the initial issuers after the issue (i.e., the level of retained ownership) for the sample firms are 76.53% and 76.90%, respectively. This figure is comparable with IPOs in some Asian countries, such as 74.18% for Malaysian IPOs (Paudyal et al., 1999), 68.73% for Singaporean IPOs (Lee et al., 1996b), and 69.71% for Korean IPOs (Kim et al., 1995a). The proportion of retained ownership varies from 30.00% to 96.20%. A deeper examination reveals that during early market boom periods (1989-1990) ownership retention is higher than in the subsequent periods (1991-1997). The mean (median) value of retained ownership is 80.0% (80.7%) for 1989-1990, compared to 75.3% (75.0%) for 1991-1997. The mean difference of the proportion of ownership retention between these two periods is significantly different from each other ($p < .001$). Thus, it appears that the state of the market affects the issuers' decision on the amount of shares they offer.[14]

The mean and median standard deviations of aftermarket returns for the first ten days of trading, excluding the first day return, of the sample firms are 2.66% and 2.07%,

[14] There appears a tendency during the early market boom (1989 and 1990) for the issuers of Indonesian IPOs to offer the issue at a higher price than in the subsequent periods. The mean offer price of 8,557.2 for the early market boom is statistically significant compared to the mean offer price of 3,558.3 for the subsequent periods ($t = 12.197$, $p < .0000$). Thus, it is clear that for issuers who want to raise a similar amount of the issue size, selling at a higher price means fewer shares can be offered.

respectively. The standard deviations of aftermarket return vary from 0.17% to 11.92%. The figures show that IPO firms examined in this study experience, on average, little price changes following the issues.

More than three-quarters of the sample firms examined in this study (78.5% or 117 firms) used prestigious underwriters when they went public. Just over two-third of the sample firms (64.4% or 96 firms) went public during the boom periods (1989, 1990, 1993, and 1994).

5.1.1 Test of Hypothesis 1

Table 5.3 provides summary statistics of the degree of initial returns for the full sample firms. The table also presents various measures of initial returns as an examination of the sensitivity of the measures used to calculate initial returns. The Table shows that there are differences in the level of initial returns between the measures. The initial returns range from 8.03% to 9.59%. The lowest initial return is the fifth measure, that is, when the initial return is measured as the natural logarithm of the average of first week's price relative to the offer price. The highest initial return is the fourth measure, that is, when initial return is measured as the difference between the average of the first five days price and the issue price. The t-tests for mean differences between measures do not indicate any significant difference at traditional levels. This finding suggests that the selection of the initial return as the dependent variable accounts little for the extent of underpricing. Hence, the level of initial return is not sensitive to the measures used to calculate it.

As shown in Table 5.3, the mean raw initial return for the full sample is 9.47% and is statistically significant ($p < .001$), with a minimum initial return of –26.47% and a

maximum initial return of 134.48%. The average underpricing of 9.47% means that about Rp. 1,067.6 billion funds raised for the IPO firms examined in this study are left on the table. On average, each of the IPO firms has left Rp. 7.16 billion on the table. This is quite a significant amount as the average gross proceed from the issue is Rp. 75.64 billion (Refer to Table 5.1).

Table 5.3

Results of Various Measures of IPO Initial Returns

No	Measures	Mean	Med.	S.Dev.	Kurt.	Skew.	Min.	Max.
1	UP1	9.47[a]	5.26	17.06	1,922.47	304.59	-26.47	134.48
2	MAUP	9.49[a]	5.32	17.10	2,072.69	318.75	-26.92	137.07
3	UPL_j	8.04[a]	5.13	13.76	689.76	129.55	-30.75	85.22
4	$UPA5D_j$	9.59[a]	4.00	17.62	858.26	205.99	-30.26	111.93
5	$UPLA5D_j$	8.03[a]	3.92	14.69	385.31	91.30	-36.03	75.11

[a] denotes coefficient being significantly different from zero at 0.001 level.

$UP_j = (P_{j,t} - P_{j,off}) / P_{j,off}$
$UPL_j = \ln (P_{j,t} / P_{j,off})$
$UPA5D_j = (P_{j,v} - P_{j,off}) / P_{j,off}$
$UPLA5D_j = \ln (P_{j,v} / P_{j,off})$,
$MAUP_j = [(P_{j,t} - P_{j,off}) / P_{j,off}] - [(MI_{jt} - MI_{j,t-1}) / MI_{j,t-1}]$

Where P_{jt} is the first day closing price of security j, $P_{j,off}$ is the offering price of security j, MI_{jt} is market index on the day of the issue of security j, $MI_{j,t-1}$ is market index on the day before the issue of security j, and $P_{j,v}$ is the average of the first five day price after the issue of security j.

The median raw initial return of 5.26% indicates a substantial skewness in the distribution of initial-day returns. The sign test ($p < .001$) and Wilcoxon signed rank test ($p < .001$), however, indicate that the 5.26% median return is significantly different from zero. A standard deviation of 17.06%, which is almost double the figure of the mean return, illustrates the presence of significant differences in initial-day returns across individual firms. This high variability in the extent of initial returns may be attributed to

some factors. This has obviously provided a further rationale for examining whether various characteristics of the IPOs could explain differences in reported initial returns.

The finding of significant underpricing supports the hypothesis that Indonesian IPOs are underpriced, on average (H_1). This finding also confirms the widely documented evidence that the IPOs of common stock are underpriced, on average. Consistent with previous studies, this study finds that 75.84% of the firms (113 firms) are underpriced (with initial returns ranging from 0.69% to 134.48%), while 10.74% (16 firms) are overpriced, in that the first day closing price is lower than the offer price (with initial return ranging from –26.47% to –1.47%). The remaining 20 firms (13.42%) do not experience a price change in their first day of trading.

The findings reported in Table 5.3 are slightly lower compared to those reported in earlier studies of Indonesian IPOs by Rizka (1995), Sautma (1998), and Hanafi (1998), who document significant underpricing of 12.5%, 10.1%, and 15.1%, respectively. The difference in the extent of significant underpricing reported in this study may be attributed to several factors. Firstly, this study excludes firms in finance and insurance industries, real estate, property, and construction industries, and investment companies, whilst most of the previous studies do not. Secondly, this study uses raw initial-day returns in measuring the level of underpricing, while most of previous studies consider market returns. However, if the market adjusted return is used, the level of underpricing is about the same as when using the raw return (see Table 5.4). An examination of the extent of market returns shows that the mean and standard deviations of market returns during the first trading day for each of IPO firms examined are –0.02% and 1.24%, respectively. This indicates that market returns do not really have a significant impact on the extent of initial returns. Beatty and Ritter (1986) also note that when market returns

have little impact on reported returns, the use of raw returns is preferable in performing cross-sectional analysis of initial returns. Thus, the use of raw returns would reflect the IPO firms' actual performance.

Table 5.4

Industrial Classification, Year of Offering, and Raw Initial Returns of the IPO Firms

	# of IPO	% of IPO	Mean	Med.	S.Dev.	Kurt.	Skew.	Min.	Max.
Panel A: Industrial Classification and the Degree of Underpricing									
11-19	5	3.36	5.41	2.15	7.56	215.59	156.61	0.00	17.95
21-29	5	3.36	7.87[c]	5.26	6.36	-208.53	7.87	0.00	14.94
31-39	48	32.21	7.78[a]	2.81	15.57	324.35	140.48	-24.29	56.73
41-49	35	23.49	12.20[b]	6.06	25.69	1,519.37	334.31	-26.47	134.48
51-59	26	17.45	7.08[c]	3.70	13.09	132.83	27.32	-25.64	37.21
71-79	5	3.36	6.64	3.91	9.08	343.59	181.37	0.00	22.22
91-99*	25	16.77	13.11[a]	11.19	11.58	-120.03	27.04	-5.26	33.68
Panel B: Year of Offering and the Degree of Underpricing									
1989	12	8.05	22.09[d]	9.92	37.03	940.85	296.08	0.00	134.48
1990	41	27.52	9.01[a]	4.35	13.58	204.33	154.49	-11.11	50.00
1991	11	7.38	0.93	2.68	7.91	415.84	-178.87	-19.29	10.11
1992	10	6.71	8.71[b]	8.23	8.51	73.00	93.63	0.00	26.67
1993	17	11.41	24.02[a]	24.71	16.83	-36.14	48.02	0.00	56.73
1994	26	17.45	2.93	1.44	10.59	139.08	-12.72	-24.29	24.19
1995	10	6.71	-0.38	1.44	10.59	383.55	-140.43	-25.64	15.38
1996	13	8.72	8.45[a]	7.69	7.07	147.03	-89.22	-25.64	17.95
1997	9	6.04	9.90	15.38	16.21	266.23	-154.98	-26.47	23.73
Total	149	100.00	9.47[a]	5.26	17.06	1,922.47	304.59	-26.47	134.48

[a, b, c, d] denote the coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

Industry classification is defined as follows: 11-19 for agriculture, 21-29 for mining, 31-39 for basic industry and chemical, 41-49 for miscellaneous industry, 51-59 for consumer goods industry, 71-79 for infrastructure, utility, and transportation, and 91-99 for trade and services.

* This excludes companies in the 98 code, which is the investment company.

Table 5.4 reports the degree of initial returns partitioned on the basis of the industry classifications (Panel A) and year of offering (Panel B). Panel A of Table 5.4 shows that two industries (that is, miscellaneous industry with initial return of 12.20%, and trade and services industry with initial return of 13.11%) appear to exhibit larger initial returns compared to the other industries. Test on mean difference of these two industries shows that the mean is not significantly different from each other (t= -0.165). For the seven industries examined, only in two industries (that is, agriculture and infrastructure, utility, and transportation) are the initial returns not significantly different from zero. Three industries: agriculture, mining, and infrastructure, utility, and transportation, recorded overpricing, in that the first day closing price was lower than the offering price.

Unlike the US or Australia, there are only small numbers of firms in the mining industry listed on the Indonesian stock market. Previous studies have documented that IPO firms in the mining industry have a higher degree of underpricing than IPOs in other industries, given the fact that mining IPOs exhibit greater risk, and thus investors demand greater return (see for example Ritter, 1984). Later in the section, I examine the difference in initial returns between two major groups of industries.

Looking at the year of IPO base, as shown in Panel B of Table 5.4, this study finds that during the bullish periods, when more firms made IPOs (especially for 1989 and 1993), the degree of underpricing is greater than during the bearish periods. Husnan (1994) and Winarto (1997) note that Indonesian stock markets experienced market booms in 1989, 1990, 1993, and 1994. Husnan and Winarto assume that these periods to be the bullish periods, a period where there are considerably many firms making IPOs compared to other period. Of these periods, only in 1994 are Indonesian IPOs marginally

underpriced ($p < .12$). Thus, it appears that firms that went public during these periods were more underpriced than firms that made IPOs in other periods. This finding supports Ritter's (1991) claim of the existence of a cycle in IPO underpricing. That is, IPO firms tend to be more underpriced when more IPOs enter the market and less underpriced when fewer IPOs enter the market. As can be seen in Panel B, Indonesian IPO firms are significantly underpriced in six of the nine years of examination.

To examine the behaviour of the initial returns in initial trading days, the first twenty days of trading are analysed. Table 5.5 shows the average daily raw and adjusted initial returns as well as the cumulative mean returns over twenty days subsequent to the first trading day. The results of tests of mean differences of the cumulative returns suggest that neither the mean raw, nor market adjusted, returns in the subsequent days following the issue is significantly different from zero. This finding confirms the assertion that investors will not be able to earn significant abnormal returns in the days following the issue of an IPO. The evidence of no excess return in the aftermarket prices is indicative of efficiency in the pricing of the Indonesian secondary market. Thus, investors who bought in the secondary market were unlikely to earn excess returns on average over various trading periods from one day to one month.

Table 5.5

Mean Daily Initial Return and Cumulative Mean Return of the IPO Firms

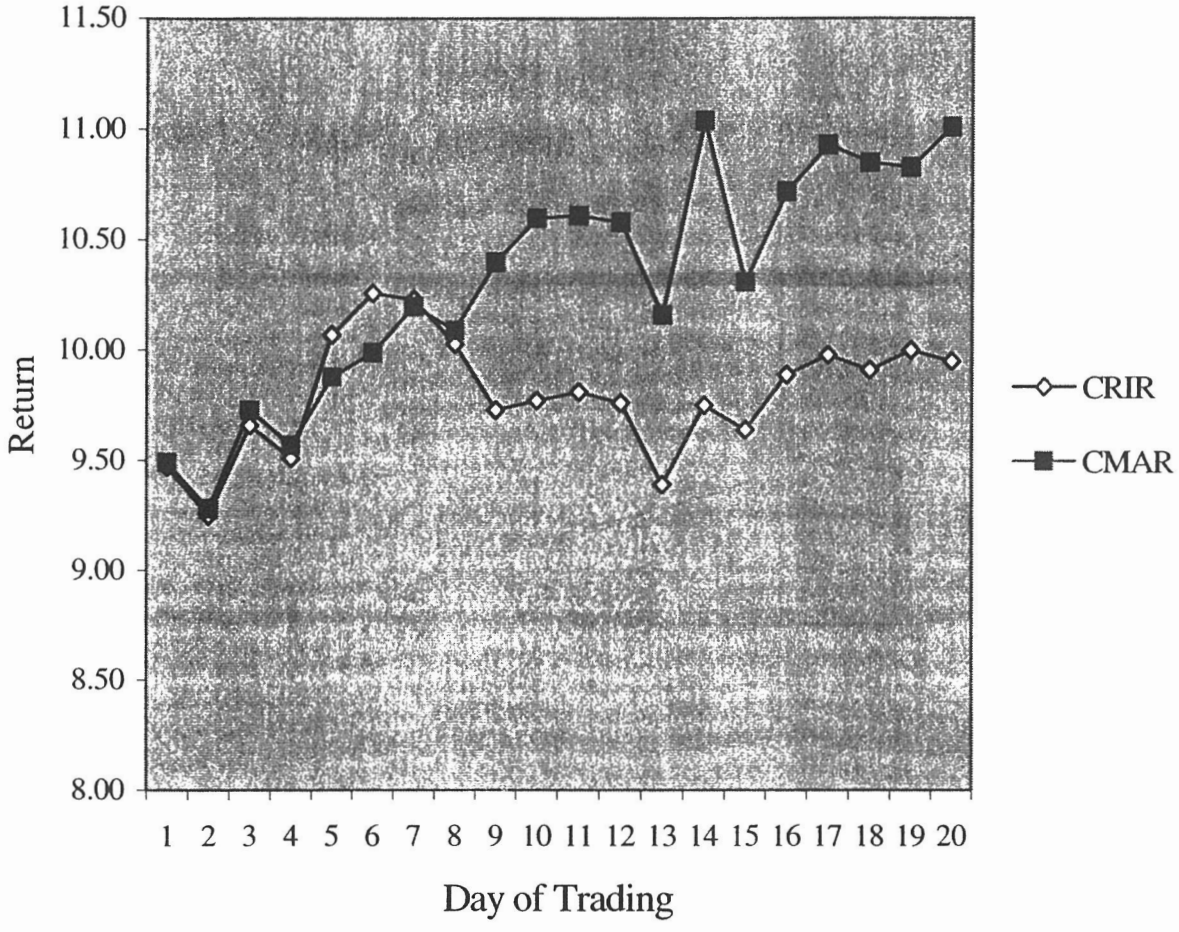
Day	Raw Initial Return	Cumulative Raw. Return	Market Adjusted Initial Return	Cumulative Market Adjusted Return
1	9.47[a]	9.47	9.49[a]	9.49
2	-0.22	9.25	-0.21	9.28
3	0.41	9.66	0.45	9.73
4	-0.15	9.51	-0.16	9.57
5	0.56	10.07	0.31	9.88
6	0.19	10.26	0.11	9.99
7	-0.03	10.23	0.21	10.20
8	-0.20	10.03	-0.11	10.09
9	-0.30	9.73	0.31	10.40
10	0.04	9.77	0.20	10.60
11	0.04	9.81	0.01	10.61
12	-0.05	9.76	-0.03	10.58
13	-0.37	9.39	-0.42	10.16
14	0.36	9.75	0.88	11.04
15	-0.11	9.64	-0.73	10.31
16	0.25	9.89	0.41	10.72
17	0.09	9.98	0.21	10.93
18	-0.07	9.91	-0.08	10.85
19	0.09	10.00	-0.02	10.83
20	-0.05	9.95	0.18	11.01

[a] denotes coefficient being significantly different from zero at the 0.001 level.
Raw initial return is measured as $(P_t - P_{t-1}) / P_{t-1}$. The market adjusted initial return is measured as $[(P_{j,t} - P_{j,off}) / P_{j,off}] - [(MR_{jt} - MR_{j,t-1}) / MR_{j,t-1}]$.

Figure 5.1 presents the behaviour of initial day's returns of IPO firms examined in this study. The graph shows the average cumulative raw initial returns and market adjusted initial returns from the first to the twentieth day of trading. The market adjusted initial returns exceed the raw initial returns starting in the eighth day of trading.

Figure 5.1

Cumulative of Mean Raw and Market Adjusted Returns from the First Day to the



Twentieth Day of Trading.

Note. CRIR is cumulative raw initial returns and CMAR is cumulative market adjusted initial returns.

Next, I examine the stock return performance of the IPO firms in their first year as a public company. Table 5.6 presents the first one-year returns resulting from investing in Indonesian IPO markets. From the Table, it appears that investors in Indonesian IPO markets are, on average, able to earn abnormal returns for up to the first six months of the trading of the shares. For example, as shown in Panel A of Table 5.6, investors who

bought shares at the offering price and sold them at the end of the first week will earn, on average, an abnormal return of 10.24% (the returns range from –35.29% to 113.79%). The mean return of 10.24% is statistically significant ($p < .001$). A significant mean raw return of 10.56% will be earned if they sell the shares at the end of the sixth month (the returns range from –71.05% to 237.93%). Holding shares up to their first anniversary year will give investors an abnormal return of 2.57%. This mean return is, however, insignificantly different from zero. Qualitatively similar results are obtained when the returns are adjusted for the market returns (see Panel B).

Overall, therefore, the results reported in Table 5.6 indicate that the positive returns to investors in Indonesian IPOs are obtained up to their first anniversary year. This result suggests that there is still the possibility to earn abnormal returns in the Indonesian IPO market within one year of their first trading. The results also suggest that the abnormal returns following the issue are related to returns on first day of trading. Given the limitation of the number of firms listed on the JSX and also the number of comparable firms, this study is unable to compare the initial market performance of the IPO firms examined and those of comparable firms.

Table 5.6

Raw Initial Returns over Various Holding Periods of the IPO Firms

Period	Mean	Med.	S.Dev.	Kurt.	Skewn.	Min.	Max.
Panel A: Raw Return							
1st day	9.47[a]	5.26	17.06	1,922.47	304.59	-26.47	134.48
1st week	10.24[a]	3.70	20.22	781.36	209.00	-35.29	113.79
2nd week	10.26[a]	4.62	23.10	635.81	180.34	-50.00	130.34
3rd week	10.07[a]	5.60	23.84	486.29	179.86	-48.48	131.38
1st month	10.21[a]	4.30	24.72	273.69	168.00	-50.76	117.24
6th month	10.56[b]	2.88	48.57	418.18	308.98	-71.05	237.93
1st year	2.57	-8.06	67.23	834.77	509.01	-98.67	410.34
Panel B: Adjusted Return							
1st day	9.49[a]	5.32	17.10	2,072.69	318.75	-26.92	137.07
1st week	10.16[a]	4.74	19.48	956.70	223.58	-30.40	117.73
2nd week	10.05[a]	5.49	21.80	857.43	198.89	-36.25	133.86
3rd week	9.99[a]	6.82	23.03	618.78	134.60	-49.18	135.31
1st month	10.38[a]	7.58	23.21	382.13	116.80	-48.58	122.38
6th month	13.22[a]	9.93	42.33	533.13	137.79	-74.41	236.77
1st year	7.04	-5.51	63.47	974.18	204.84	-121.86	401.94

[a] and [b] denote the coefficient as being significantly different from zero at the 0.001and 0.01 levels, respectively.
The raw initial returns are measured as the difference between the price at period t minus the offer price divided by the offer price, while for the adjusted initial returns the measures are adjusted by the market return in their corresponding periods.
The return for the other periods is calculated as follows: $R_t = P_t - P_0 / P_0$, where P_t is the price at period t and P_0 is the offering price. For the adjusted return, the market return on the corresponding periods is used.

In the following, I examine the relationship between the IPO's time lapse and the degree of underpricing. Previous studies, such as How et al. (1995) and Lee et al (1996a), have shown that the degree of underpricing is negatively related to the time lapse of the issue. Time lapse is defined as the number of days from the day the statement of

registration becomes effective to the date of listing. These studies use Australian IPOs. How et al. argue that the level of time lapse, or the amount of time to listing, is a potential proxy for the level of informed demand. They further argue that an issue that has a shorter filing period (which also means that it is sold more quickly) has a significantly higher level of informed demand and is thus subject to greater underpricing. Thus, a negative relationship between the level of time lapse and the degree of underpricing is predicted. Common sense also suggests that when there is sufficient time to assess the IPO, as indicated by a longer time lapse, investors will be able to value the IPO better, resulting in lowering the ex ante uncertainty and thus lower underpricing.

To test whether this finding holds for Indonesian IPOs, I divide the sample firms into three groups based on their time lapse. Table 5.7 shows the time lapse between the listing date and the first day of trading alongside the descriptive statistics of initial returns. The time lapse between the registration date and the first day of trading ranges from 7 to 90 days, with mean and median values of 41.95 and 40 days, respectively.

The results shown in Table 5.7 suggest that IPO firms with longer time lapses are marginally more underpriced than those with shorter time lapses. That is, the longer the time lapse the higher is the degree of underpricing. The t-tests between groups, however, do not show that the means are significantly different. This finding is similar to that of James et al. (1995) of unit trust IPOs in Australia. The pair-wise correlation, not reported in the Table, between the time lapse and the degree of underpricing indicates a positive but insignificant correlation of 0.0946. This finding is in contrast to How et al. (1995) and Lee et al. (1996a) who document an inverse relation between the time lapse and the degree of underpricing in Australian IPOs.

Table 5.7

Initial Returns and Time Lapse of the IPO Firms

Initial return is the raw initial return. Time lapse is measured as the periods from the effective date of the statement of registration to the listing date and is expressed in the number of days.

Group	Time Lapse (days)	# of firms	Mean	Median	S.Dev.	Min.	Max.
I	≤ 33	52	9.32[a]	6.17	13.94	-24.29	56.73
II	$34 \geq 48$	50	7.28[a]	4.18	15.00	-26.47	50.00
III	>48	47	11.98[a]	5.41	21.66	-5.19	134.48

[a] denotes coefficient as being significantly different from zero at the 0.001 level.

As discussed earlier, industry membership is related to the degree of underpricing; that is, certain industry types exhibit greater initial returns than do others (Refer to Table 5.3). Earlier evidence shows that the degree of underpricing differs significantly between industries (Ritter, 1984). Ritter finds that IPOs in the mining industry are, on average, more underpriced than IPOs in other industries. To examine whether initial return is related to industry membership, the sample firms are partitioned into two industry groups. Thus, the results shown in Table 5.8 would complement earlier findings reported in Table 5.3.

Due to the limitation of the numbers of IPO firms in the mining industry, this study only examines two groups of industries. The group classification is based on the following reasoning. Firstly, the JSX, and also some national newspapers such as Kompas and Bisnis Indonesia, have regularly published company stock performance according to their industry membership. As well as a classification based on individual industries, they are also grouped into two or more larger categories. The manufacturing industry is one of them, and it consists of three industries: basic industry and chemicals,

miscellaneous industries, and consumer goods industry. Secondly, an earlier study failed to find any significant differences between single industries (Hanafi, 1998). Thus, grouping companies into smaller classifications is expected to shed some further light.

Table 5.8 provides the results of assessing the relationship between industry membership and initial returns. The first group (labelled manufacturing) consists of 109 firms. The second group comprises those industries that are not in the first group, and it consists of 40 firms. The results show that IPO firms in the first group exhibit lower initial returns compared to those in the second group. The t-test of the mean differences between groups is, however, insignificant ($t = .671$, $p < .252$). This finding suggests that there is no significant difference in initial returns between the two major groups of industries. Thus, it appears that industry membership is not related to initial return variation. This finding supports that of Hanafi (1998).

Table 5.8

Initial Returns and Industry Membership of the IPO Firms

Industry	# of firms	Mean	Median	S.Dev.	Min.	Max.
31-39, 41-49, 51-59	109	9.03[a]	5.26	18.91	-26.47	134.48
11-19,21-29, 71-79, 91-99*	40	10.68[a]	6.66	10.56	-5.26	33.68

[a] denotes coefficient as being significantly different from zero at the 0.001 level.

Initial returns are measured as the raw return. Industry classification is defined as follows: 11-19 for agriculture, 21-29 for mining, 31-39 for basic industry and chemical, 41-49 for miscellaneous industry, 51-59 for consumer goods industry, 71-79 for infrastructure, utility, and transportation, and 91-99 for trade and services.

* This excludes companies in the 98 code, which is the investment company.

5.2 Preliminary Analyses of the Relationship between Independent Variables and Initial Returns

Before proceeding to univariate and multivariate analyses, I will first examine the relationship between initial returns and each of the selected proxies for ex ante uncertainty used in this study. In doing so, the sample firms are first partitioned into high and low ex ante uncertainty subsamples. The average initial returns for the subsamples are then compared with each other using a standard t-test. For each of the continuous measures (FL, OL, SIZE, GRO, PRO, OWN, AGE, and SDR) the median value is used as the cut-off point, and splits the firms into two subsamples. For the dichotomous variables (UWQ and MC), the sample firms are split on the basis of the value assigned to the variables. It is predicted that underpricing decreases with size, profitability, underwriter quality, and years in operation (age). Underpricing is expected to increase with financial leverage, operating leverage, growth, ownership retention, standard deviation of aftermarket return, and market condition.

Table 5.9 presents the statistics for initial returns for the sample partitioned on the basis of median values for the continuous variables and the value assigned to the variables for the dichotomous variables. As can be seen in Panel A of Table 5.9 and in support of the prediction, it is found that initial returns increase with financial leverage. This is correct for all three financial leverage measures (FL1, FL2, and FL3). The strongest relationship is found for FL1. The t-tests for differences in means show that IPO firms with lower financial leverage have significantly lower initial returns compared to those with higher financial leverage ($p < .001$ for FL1 and $p < .10$ for FL2 and FL3). The mean initial returns for firms with low and high FL1 are 4.76% and 14.27%,

respectively. The mean initial returns for firms with low and high FL2 and FL3 are 7.25% and 11.73%, and 7.29% and 10.89%, respectively.

The results reported in Panel B of Table 5.9 do not support the prediction that IPO firms having high level operating leverage, measured as the ratio of total assets to sales (OL1) and fixed assets to total assets (OL2), tend to have higher average initial returns. In fact, operating leverage appears to have been negatively related to initial returns. The mean initial returns for firms with low and high OL1 and OL2 are 13.42% and 5.4%, and 12.55% and 6.35%, respectively. The t-tests of mean differences between subsamples for the two measures of operating leverage are statistically significant (OL1 has $p < .01$, while OL2 has $p < .05$).

In support of the prediction, the IPO size (SIZE2), measured as the natural logarithm of gross proceeds, decreases with initial return (Panel C). That is, larger IPOs tend to experience, on average, lower degrees of underpricing (the mean initial returns for low and high IPO size are 13.42% and 5.47%, respectively). The t-test for mean differences is significant at the 5% level. The result using natural logarithm of sales (SIZE1) in the most current year prior to the offering, however, is in sharp contrast to that using gross proceeds. IPO firms with larger sales appear to be more underpriced than IPOs with lower sales. The mean difference, however, is not significant ($t = 0.132$). Thus, the degree of underpricing is increasing with the level of sales.

Table 5.9

Average and Standard Deviation of Initial Return Partitioned on the Basis of Median Value for Continuous Variables and on the Basis of the Value Assigned to the Variables for Dichotomous Variables

FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 total assets / sales; OL2 fixed assets / total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as ($sales_t$ – $sales_{t-1}$) / $sales_{t-1}$; GRO2 is measured as (total $assets_t$ – total $assets_{t-1}$) / total $assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Ex ante uncertainty, and consequently underpricing, is predicted to increase with financial leverage (FL), operating leverage (OL), growth (GRO), ownership retention level (OWN), standard deviation of return (SDR), and market condition (MC), and decrease with firm size (SIZE), profitability (PRO), underwriter quality (UWQ), and IPO age (LAGE).

Variable[α]	Partition	# Firm	Mean UP	σUP	t-value[β] (F-value)[φ]
		Panel A: Financial Leverage (%)			
FL1	≤ 39.60	75	4.76	9.86	3.509[a]
	> 39.60	74	14.25	21.10	(4.757[a])
FL2	≤ 66.17	75	7.25	13.52	1.605[d]
	> 66.17	74	11.73	19.86	(2.156[a])
FL3	≤ 200.00	75	7.29	13.66	1.577[d]
	> 200.00	74	10.89	19.78	(2.084[a])
		Panel B: Operating Leverage (%)			
OL1	≤ 115.71	75	13.42	20.03	2.925[b]
	> 115.71	74	5.47	12.29	(2.679[a])
OL2	≤ 34.38	75	12.55	20.01	2.254[c]
	> 34.38	74	6.35	12.82	(2.281[a])
		Panel C: Firm Size (Natural Logarithm)			
SIZE1	≤ 24.8009	75	9.29	13.53	0.132
	> 24.8009	74	9.66	20.11	(2.208[a])
SIZE2	≤ 24.4121	75	13.42	20.49	2.924[b]
	> 24.4121	74	5.47	11.50	(3.174[a])
		Panel D: Firm Growth (%)			
GRO1	≤ 31.38	75	8.76	14.69	-0.513
	> 31.38	74	10.19	19.24	(1.715[b])

Table 5.9 (continued)

GRO2	≤ 33.53	75	11.25	21.62	1.291[d]
	> 33.53	74	7.67	10.47	(4.291[a])
	Panel E: Firm Profitability (%)				
PRO1	≤ 15.95	75	11.59	19.46	1.536[d]
	> 15.95	74	7.32	14.03	(1.924[b])
PRO2	≤ 7.80	75	11.93	19.75	1.789[c]
	> 7.80	74	6.97	13.50	(2.141[a])
PRO3	≤ 6.26	75	10.68	19.52	0.868
	> 6.26	74	8.25	14.17	(1.899[b])
	Panel F: The Quality of Underwriter				
UWQ	0	32	8.75	15.10	0.296
	1	117	9.67	17.61	(1.360)
	Panel G: The Level of Retained Ownership (%)				
OWN	≤ 76.90	75	7.57	13.55	1.373[d]
	> 76.90	74	11.40	19.91	(2.159[a])
	Panel H: Age (Operating History) (year)				
AGE	≤ 16.00	73	10.35	13.16	0.619
	> 16.00	76	8.63	20.16	(2.347[a])
	Panel I: The Standard Deviation of Aftermarket Returns (%)				
SDR	≤ 2.21	75	8.12	11.55	0.973
	> 2.21	74	10.85	21.23	(3.773[a])
	Panel J: Market Condition (the State of the Market)				
MC	0	53	8.09	13.95	1.183
	1	96	11.97	21.51	(3.293[a])
	Panel K: Offering Price and Number of Shares				
PRICE	≤ 4,750.00	75	9.43	15.69	0.030
	> 4,750.00	74	9.52	18.45	(1.382[d])
# of Shares	≤ 9,300,000	73	13.28	20.24	2.702[b]
	> 9,300,000	76	5.82	12.27	(2.677[a])

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

[β] t-test values for differences in average of raw initial return between high and low ex ante uncertainty subsamples. The subsamples are formed on the basis of the selected proxies for ex ante uncertainty.

[φ] F-test values for differences in variance of raw initial return between high and low ex ante uncertainty subsamples. The subsamples are formed on the basis of the selected proxies for ex ante uncertainty.

Although not reported here, a similar result of a positive association is evident when total assets is used as the proxy for firm size. This conflicting result is interesting given the nature of these two proxies for firm size, which suggests that they must have been positively correlated (i.e., larger firms tend to have larger offerings). The coefficient of the bivariate correlation between gross proceeds and sales is 54.00 ($p < .001$). The correlation coefficient between sales and initial return is 0.0320%, while the correlation coefficient between gross proceeds and initial return is 28.50 ($p < .001$) (Table 5.11). Given this low correlation coefficient, sales might not be a good proxy for firm size. In addition, as shown in Table 3.5, previous studies have found that the coefficients for sales, as a proxy for firm size in the test of cross-sectional variance of initial return, have been mixed and inconsistent. On the other hand, the gross proceeds or issue size have been consistently and negatively related to the degree of underpricing.

The relation between initial return and firm growth is shown in Panel D of Table 5.9. It appears that underpricing decreases with firm growth, when growth is measured as total assets growth. The mean initial returns for low and high assets growth firms are 11.25% and 7.67%, respectively. The t-test of mean differences is significant only at the 10% level. In contrast to total assets growth, it is found that IPO firms with higher sales growth tends to be more underpriced than those with lower sales growth (the mean initial returns are 8.76% and 10.19%, respectively). Thus, a mixed finding in relation to the association between initial returns and the proxies for firm growth is evident. However, as shown in the next section, these two proxies for growth have a negative relationship with initial returns. The findings reported in Panel D do not support the prediction that initial return increases with firm growth.

Panel E of Table 5.9 shows that, on average, IPO firms with higher levels of profitability tend to be less underpriced, compared to those with lower profitability. The mean initial returns for low and high PRO1, PRO2, and PRO3 are 11.59% and 7.32%, 11.93% and 6.97%, and 10.68% and 8.25%, respectively). The t-tests of mean differences show that only PRO1 and PRO2 are significantly different at the 10% level. Overall, the findings reported in Panel E support the prediction that initial return decreases with profitability.

The t-tests of the differences in average initial returns for high and low subsamples formed on the basis of selected accounting risk measures suggest that the initial returns of firms with high average initial return are statistically greater than those with low average initial return at the 5% level. This significance level holds for each of selected accounting risk proxies except for Growth, which is significant at the 10% level. The results of the F-tests for differences in the variance of initial return provide further evidence that the selected accounting risk proxies appear to capture the dimension of ex ante uncertainty. The F-tests indicate that the variance between subsamples are statistically significant at the 0.1% level except for GRO1, PRO1, and PRO3 (significant at the 1% level). It should be noted, however, that the F-test values have considerably high variation. The F-values range from 1.715 to 4.757. This suggests that some accounting risk measures have a better ability to discriminate between high and low ex ante uncertainty, while some may have been identified as noisy proxies (those with lower F-values). Results using adjusted initial returns are qualitatively similar to those using raw initial returns (See Appendix 1).

In summary, despite previous evidence of mixed findings concerning the relation between the degree of underpricing and the proxies for accounting risk measures, it has

been shown that the selected accounting risk proxies appear to capture the extent of initial return. This has made it difficult to draw inferences about the overall relation between accounting risk proxies and the underpricing of Indonesian IPOs. However, as some variables have been found to be significantly related to the extent of underpricing, it can be argued that the selected accounting risk measures are potential proxies for ex ante uncertainty. This assertion is empirically supported in later sections.

Panels F through J of Table 5.9 present tests of the relation between initial returns and the control variables. Panel F shows that, out of 149 sample firms, 117 IPOs are underwritten by a prestigious underwriter. In contrast to the prediction, it appears that IPO firms engaged with more prestigious underwriters are more underpriced than those that do not employ prestigious underwriters. The mean initial returns for firms with low and high quality underwriters are 9.31% and 9.62%, respectively. However, this modest difference is not statistically significant.

The relationship between initial return and the level of ownership retention is shown in Panel G. The results suggest that underpricing increases with ownership levels, which is in support of the prediction (the mean initial returns for low and high ownership levels are 7.57% and 11.40%, respectively). The difference of initial returns between firms with low and high ownership retention is significant at the 10% level. Further, this study finds that younger IPOs tend to be more underpriced than older ones (Panel H of Table 5.7). The mean initial returns for younger IPOs is 9.93%, and 8.91% for older IPOs. The t-test of mean differences is, however, insignificant at the traditional level.

Underpricing appears to increase with the standard deviation of aftermarket returns (Panel I), which is in support of the prediction of a positive relationship. The mean initial returns for IPO firms with low and high standard deviations of aftermarket

return are 8.11% and 10.85%, respectively. The mean difference between these two groups is, however, insignificant. Panel I also shows that the standard deviation of initial returns for firms experiencing higher variance of aftermarket returns is almost double the figure of firms with a lower variance of aftermarket returns (column 5). The high standard deviation of initial return could affect the overall relationship between the extent of underpricing and the standard deviation of aftermarket return (as shown in the next section, this assertion is empirically supported).

Panel J of Table 5.9 shows that the initial returns for firms going public during hot and cold periods are 11.97% and 8.09%, respectively. Thus, consistent with the second phenomenon of IPOs, the cycle in the initial returns, this study finds that firms making an IPO during a bull market appear to be more underpriced. However, this assertion seems to be premature given the result of the t-test that indicates that the means between the two groups are not significantly different from each other.

Table 5.9 also provides evidence that IPO firms selling an issue with a lower offering price tend to be more underpriced than those that sell an issue at a higher offering prices (Panel K). The mean initial returns for firms with low and high offering prices are 9.43% and 9.52%, respectively. The mean initial return is insignificantly different between the two groups. Thus, it appears that initial return variation is not related to price differences.

Finally, I examine the possible relationship between the number of issued shares, which is a potential proxy for liquidity, and the degree of underpricing. As shown in Panel K of Table 5.9, the number of issued shares decreases with the degree of underpricing. IPO firms offering lower numbers of shares are more underpriced than those that offer larger share volumes. The mean initial returns for firms offering lower

and larger share numbers are 13.28% and 5.82%, respectively. The mean difference is statistically significant at the 1% level. Thus, firms with lower liquidity, as indicated by the number of shares traded, are more underpriced than those IPOs with higher liquidity. One possible explanation of this positive relationship is that IPO firms offering lower numbers of shares are subject to greater rationing when demand for the issue exceeds the available shares being offered. For example, assuming that the number of investors, the demand for the issue, and the degree of underpricing are constant, a limited number of shares offered will reduce investors' probability of receiving their expected allocated shares. This will force them to crowd in the secondary market (especially when the issue is perceived as being good value), which will increase the demand for the issue and consequently lift the price, finally resulting in higher underpricing.

The initial analysis of the relationship between the degree of underpricing and the control variables suggests that the selected control variables appear to be of potential proxies for ex ante uncertainty, at least for the level of retained ownership and the state of the market. The F-tests of differences in the variance of initial return between high and low ex ante uncertainty subsamples indicate that only the underwriter quality variable is not statistically significant. All other variables are significant at the 0.1% level. Results based on the adjusted initial return provide a similar conclusion (See Appendix 1). The results of univariate analysis provided in the next section give further support for this assertion.

5.3 Univariate Analyses

As shown in the previous section, the degree of underpricing is related to the proxies for ex ante uncertainty. In this section I provide further analysis of the

relationship between the degree of underpricing and the proxies for ex ante uncertainty. To do so, I perform a simple regression using the raw initial returns as the dependent variable and each of the proxies for ex ante uncertainty as the independent variable. Because homoscedasticity is rejected in only two out of seventeen simple regressions, standard errors and t-statistics are based on simple ordinary least squares. The analysis is compiled with the results of the bivariate Pearson correlations between the degree of underpricing and each of the proxies for ex ante uncertainty.

Table 5.10 provides the results of the simple regression tests. Because homoscedasticity is rejected in two regressions (FL1 and SDR) at the 1% level, the reported standard errors and t-statistics are based on the simple regressions. The results of the bivariate correlation are presented in Table 5.11. The results of the simple regressions reveal that, out of five accounting risk proxies, only financial leverage is found to be significantly related to the initial return. Size is only significantly related to initial return when the gross proceeds (SIZE2) are used. Details of research findings are presented next.

All three alternate measures of financial leverage are positively related to the degree of underpricing (FL1 is significant at $p < .001$ and Fl2 and FL3 are both significant at $p < .05$). Thus, the findings cannot reject the null hypothesis of a positive relationship between the level of financial leverage and the degree of underpricing. The Pearson correlation coefficients, shown in Table 5.11, support the results of the univariate tests, with two financial leverage proxies (FL1 and FL3) being positively related to the degree of underpricing. FL1 has the highest adjusted R-square value followed by FL3 and FL2. This initial finding suggests that FL1 appears to be a better proxy for financial leverage in relation to the degree of underpricing than the other two

candidates. Overall, the findings on the relationship between financial leverage and the degree of underpricing reported here are consistent with results reported in Table 5.9.

The coefficients for both proxies for operating leverage are negative, and do not support the prediction. Neither proxy is significantly related to the degree of underpricing. The findings reported in Table 5.11 on the correlation between operating leverage and the degree of underpricing also show similar patterns (Table 5.10). This result is consistent with the results reported in Table 5.9.

While the firms' sales (SIZE1) have a positive but insignificant relationship with the degree of underpricing, the second proxy for firm size (i.e., the natural logarithm of gross proceeds (SIZE2)) is found to be negatively and significantly related to the degree of underpricing ($p < .001$). The Pearson correlation matrix shows that the issue size (SIZE2) is negatively and significantly correlated with the degree of underpricing ($p < .001$). Thus, it appears there is a mixed finding on the relationship between firm size and the degree of underpricing.

As pointed out earlier, the use of sales as the proxy for firm size in an IPO setting produces inconsistent results. Some studies find a positive relationship, whilst others find a negative relationship. Further, some studies find no significant relationship with the degree of underpricing (See Table 3.5). On the other hand, the issue size or gross proceeds from the issue is found to be consistently and negatively related to the degree of underpricing. Given these conflicting results, at this stage it is difficult to draw inferences about the relationship between firm size and the degree of underpricing. However, as shown later in the multivariate analysis, SIZE2 appears to be consistently and significantly related to the degree of underpricing.

Table 5.10

Simple Regression of Raw Initial Returns on Explanatory Variables (n=149)

The raw initial return is measured as the difference between the first day closing price and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. Standard errors (in parentheses) are from the ordinary least squares regression. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition.

	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC
Coef.	.3188	.1563	.0209	-.0092	-.0787	.0041	-.0443	-.0159	-.0355	-.1773	-.2634	-.0232	.0119	.2647	-.0195	.3865	.0624
(SE)	(.0829)	(.0789)	(.0081)	(.0075)	(.0697)	(.0061)	(.0128)	(.0287)	(.0240)	(.1351)	(.1773)	(.2862)	(.0336)	(.1277)	(.0238)	(.6598)	(.0286)
t-stat.	3.843[a]	1.982[c]	2.588[c]	-1.237	-1.129	.671	-3.607[a]	-.555	-1.477	-1.313	-1.486	-.081	.354	2.073[c]	-.819	.586	2.183[c]
Const.	-.0328	-.0044	.0449	.1087	.1221	-.0060	1.1759	.1007	.1120	.1251	.1194	.0957	.0848	-.1071	.1453	.0832	.0541
(SE)	(.0356)	(.0516)	(.0234)	(.0182)	(.0284)	(.1499)	(.3001)	(.0183)	(.0184)	(.0274)	(.0219)	(.0242)	(.0297)	(.0984)	(.0640)	(.0232)	(.0229)
t-stat.	-.922	-.085	1.916[d]	5.968[a]	4.297[a]	-.040	3.919[a]	5.514[a]	6.088[a]	4.570[a]	5.454	3.955[a]	2.854[b]	-1.093	2.269[c]	3.588[a]	2.367[c]
Adj. R^2	8.46	1.93	3.68	.35	.18	-.37	7.50	-.47	.79	.48	.80	-.67	-.59	2.17	-.22	-.44	2.47
F-stat.	14.769[a]	3.927[c]	6.699[c]	1.531	1.275	.450	13.008[a]	.308	2.182	1.723	2.208	.007	.125	4.297[c]	.672	.343	4.767[c]
Expected Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)	(+)

[a, b, c, d,] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

Table 5.11

Pearson Correlation Coefficients for Continuous Variables

Underpricing is measured as the difference between the first day closing price and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. Standard errors (in parentheses) are from ordinary least squares regression. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. All tests are two tailed-tests.

	UP	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC
UP	1.000																	
FL1	0.299[a]	1.000																
FL2	0.154	0.728[a]	1.000															
FL3	0.204[c]	0.599[a]	0.813[a]	1.000														
OL1	-0.105	-0.057	-0.106	-0.105	1.000													
OL2	-0.100	-0.142	-0.226[b]	-0.217[b]	0.244[b]	1.000												
SIZE1	0.032	0.335[a]	0.093	0.004	-0.145	0.027	1.000											
SIZE2	-0.285[a]	-0.246[b]	-0.139	-0.171[c]	0.262[a]	0.265[a]	0.640[a]	1.000										
GRO1	-0.049	-0.049	-0.030	-0.094	-0.049	0.099	-0.001	0.002	1.000									
GRO2	-0.124	-0.048	-0.122	-0.122	0.028	-0.013	-0.118	-0.060	0.385[a]	1.000								
PRO1	-0.115	-0.259[a]	-0.338[a]	-0.282[a]	0.425[a]	0.498[a]	-0.075	0.328[a]	0.032	0.029	1.000							
PRO2	-0.127	-0.369[a]	-0.471[a]	-0.385[a]	0.433[a]	0.441[a]	-0.125	0.269[a]	0.042	0.085	0.764[a]	1.000						
PRO3	-0.012	-0.423[a]	-0.404[a]	-0.382[a]	-0.162	0.164[c]	-0.085	0.004	0.067	-0.035	0.347[a]	0.587[a]	1.000					
UWQ	0.022	0.113	0.174[c]	0.167[c]	-0.050	-0.039	-0.230[b]	-0.177[c]	0.053	-0.044	-0.029	-0.053	-0.066	1.000				
OWN	0.174	0.369[a]	0.203[c]	0.223[b]	-0.048	-0.044	0.151	-0.121	-0.004	0.101	-0.042	0.039	-0.029	0.162[c]	1.000			
LAGE	-0.090	-0.055	-0.041	-0.011	0.006	-0.121	0.141	0.200[c]	-0.060	0.043	0.073	-0.019	-0.094	-0.059	-0.147	1.000		
SDR	0.043	0.028	0.022	0.118	-0.109	0.064	-0.031	-0.166[c]	0.028	-0.149	-0.041	-0.016	0.038	0.019	-0.039	0.129	1.000	
MC	0.173[c]	-0.050	0.168[c]	0.175[c]	0.013	-0.211[b]	-0.320[a]	-0.187[c]	-0.124	-0.115	-0.072	-0.082	-0.049	0.123	0.002	-0.145	0.059	1.000

[a, b, c, d,] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

The coefficients of the two measures of growth are negative. The Pearson correlation coefficient also indicates a negative correlation between asset growth and the degree of underpricing. This result can not reject the null hypothesis of a negative relationship between growth and the degree of underpricing. Neither measure, however, is significantly related to the degree of underpricing.

As predicted, all three measures of profitability have negative relationships with the degree of underpricing. Although the correlation coefficients are negative for the three measures of profitability, none of them are statistically significant. The finding of a negative relationship (obtained from the simple regression analysis) between profitability and the degree of underpricing, rejects the null hypothesis of a positive relationship.

Out of five control variables, two variables (that is, the proportion of shares retained by initial owners, and the state of the market) are found to be significantly related to the degree of underpricing. Both variables are statistically significant at the 5% level. The coefficients found in these two variables are in the expected direction. Both the level of ownership retention and the state of the market are positively related to the degree of underpricing. Thus, the findings cannot reject the null hypothesis that the level of ownership retention, and the state of the market, are positively related to the degree of underpricing.

In contrast to the existing evidence, this study documents a positive but insignificant relationship between underwriter prestige and the degree of underpricing. It is still unclear whether the positive relationship is caused by bias in determination of underwriter quality or other factors. A number of methods have been advocated to deal with the selection between prestigious and non-prestigious underwriters, such as by separating them on the basis of the lower frequency of the number of services for each of

the underwriters. Yet, a consistent outcome of a positive, but insignificant, relationship is found.

As predicted, this study finds that underpricing decreases with the extent of firm operating history. This finding suggests that Indonesian IPOs with longer operating histories tend to experience a lower degree of underpricing compared to their counterparts of younger firms. However, the lack of a significant relationship has, perhaps, made this assertion premature.

The coefficient of the aftermarket standard deviation of return is as predicted but insignificant. The finding of a positive relationship between aftermarket standard deviation and the initial returns implies that higher underpriced IPOs may be more risky than lower ones. This finding is in support of previous results of positive correlations between (ex post) risk and the quality of IPOs.

Overall, the results from the simple regression tests provide modest support for the view that the selected accounting risk measures are related to the degree of underpricing. Given the preliminary nature of the tests, the findings reported here need further investigation. The findings vis-a-vis the control variables appear to be more convincing as only one variable (the quality of the underwriter) has a coefficient not in support of the prediction. Results using the market adjusted returns and the average of the first weeks' prices are qualitatively similar to the use of raw initial returns (See Appendixes 2 and 3). Thus, the overall results are not sensitive to the measures used to calculate initial returns.

5.4 Multivariate Analyses

Results shown in the previous sections suggest that some accounting risk proxies appear to better capture the extent of ex ante uncertainty and thus initial return. The multivariate analyses presented in this section generally serve to narrow and refine the basic conclusions drawn from the correlation and univariate tests presented in Tables 5.9 through 5.11. Table 5.12 provides the results of various regression models from possible combinations. Altogether, there are eighteen regressions. White's consistent covariance matrix estimator is used in estimating the standard errors of residuals to account for the presence of heteroscedasticity. This is because White's tests for heteroscedasticity find that homoscedasticity is rejected at the 5% level in two out of eighteen regressions. Thus, the t-values and standard errors reported in the Table are on the adjusted basis.

The results reported in Table 5.12 suggest that the selected accounting risk proxies are related, to a certain extent, to the degree of underpricing. The adjusted R^2 values range from 1.93 to 12.01. All the regression coefficients using FL1 as the proxy for financial leverage are statistically significant (Regressions 1 to 6). For FL2 the coefficients are significant in three out of six possible regressions (Regressions 8, 10, and 12). Further, four out of six regressions are significant when FL3 is used as the proxy for financial leverage (Regressions 14, 15, 16, and 18).

Some proxies are found to be consistently and significantly related to the degree of underpricing. These include FL1, SIZE2, and GRO2. The other proxies are significant in some, but not in other, regressions. Out of twelve accounting risk proxies, three are found to be insignificant in all of the regressions. These are OL2, PRO1, and PRO2. However, given the evidence that the other proxies for accounting risk measures are significant in at least some regressions, it can be argued that the proxies are contributing

to the significance of the set of accounting risk measures. As the evidence also suggests that some proxies are not significant, they might be affected by the presence of multicollinearity among variables. As shown in the section, multicollinearity is likely to be present. This makes the ability to make inferences about the statistical significance of the individual accounting risk measures difficult.

5.4.1 Test of Hypothesis 2 (Financial Leverage)

Financial leverage is consistently and positively related to the degree of underpricing. This result confirms the findings reported in the previous section. The coefficients of FL1 are highly significant in all regressions. On the other hand, FL2 is only moderately significant in one of six regressions (Regression 12), suggesting that this measure is either a poor proxy for financial leverage or is subject to multicollinearity problems. FL3 is significant in four of six regressions. Collinearity among variables might have impaired the significance level of FL3. The correlation matrix shows that FL3 is significantly related to the degree of underpricing ($p < .000$). Nevertheless, the finding of a positive and significant relationship between the proxies for financial leverage and the degree of underpricing means I cannot reject the hypothesis ($\mathbf{H_2}$).

Table 5.12

Multivariate Tests of Raw Initial Returns on Continuous Variables (n=149)

The raw initial return is measured as the difference between the first day closing price and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. Standard errors (in parentheses) are adjusted for White's (1980) heteroscedasticity consistent covariance matrix. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition.

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UW	OWN	LAGE	SDR	MC	Const.	R^2 (F)
1	.3186			-.0101		-.0052		-.0057		.0391			-.0292	.1484	-.0126	.1829	.0638	.0039	8.44
	(.1159)			(.0047)		(.0045)		(.0181)		(.0929)			(.0323)	(.1202)	(.0191)	(.8812)	(.0249)	(.0689)	(2.373)[c]
	2.750[b]			-2.154[c]		-1.158		-.314		.421			-.905	1.235	-.658	.208	2.566[c]	.057	
2	.2945			-.0085			-.0132		-.0315		.1267		-.0313	.2363	.0028	.0006	.0642	.1112	11.10
	(.1100)			(.0041)			(.0065)		(.0170)		(.1201)		(.0315)	(.1393)	(.0199)	(.8560)	(.0241)	(.1048)	(2.860)[b]
	2.678[b]			-2.101[c]			-2.045[c]		-1.849[d]		1.055		-.994	1.696[d]	.139	.001	2.658[b]	1.061	
3	.3750			-.0072		-.0078			-.0276			.4361	-.0302	.1527	-.0042	.0082	.0632	.0087	10.61
	(.1196)			(.0030)		(.0046)			(.0166)			(.2279)	(.0313)	(.1225)	(.0196)	(.8720)	(.0238)	(.0671)	(2.769)[b]
	3.135[b]			-2.355[c]		-1.675[d]			-1.667[d]			1.914[d]	-.964	1.246	-.212	.009	2.654[b]	.129	
4	.2815				.0028		-.0135	-.0022		.0059			-.0261	.2295	-.0004	.2119	.0645	.1089	9.26
	(.1103)				(.0769)		(.0063)	(.0174)		(.1105)			(.0313)	(.1328)	(.0196)	(.9145)	(.0250)	(.1031)	(2.521)[b]
	2.552[c]				.0361		-2.146[c]	-.127		.054			-.833	1.728[d]	-.022	.232	2.574[c]	1.056	
5	.3006				-.0304	-.0053			-.0300)		.0047		-.0240	.1798	-.0123	.1807	.0558	.0028	8.48
	(.1141)				(.0735)	(.0046)			.0174)		(.1255)		(.0314)	(.1302)	(.0188)	(.9094)	(.0235)	(.0662)	(2.381)[c]
	2.634[b]				-.414	-1.131			-1.727[d]		.038		-.765	1.382	-.654	.199	2.373[c]	.043	
6	.3403				-.0062		-.0147		-.0288			.4856	-.0283	.2144	.0061	.0067	.0645	.0989	12.01
	(.1098)				(.0619)		(.0059)		(.0165)			(.2340)	(.0304)	(.1319)	(.0197)	(.8849)	(.0243)	(.0967)	(3.033)[b]
	3.098[b]				-.099		-2.446[c]		-1.751[d]			2.075[c]	-.932	1.626[d]	.309	.008	2.656[b]	1.023	

Table 5.12 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC	Const.	R^2 (F)
7		.0857		-.0080		-.0021		-.0012		-.0559			-.0275	.2714	-.0191	.2788	.0508	-.0552	1.93
		(.0679)		(.0041)		(.0050)		(.0178)		(.1070)			(.0311)	(.1364)	(.0202)	(.9277)	(.0242)	(.0994)	(1.293)
		1.262		-1.943[d]		-.422		-.954		-.5232			-.883	1.989[c]	-.946	.301	2.100[c]	-.555	
8		.0788		-.0048			-.0165		-.0348		-.0493		-.0324	.4249	.0036	.0953	.0507	.1332	6.20
		(.0719)		(.0038)			(.0072)		(.0172)		(.1446)		(.0303)	(.1691)	(.0212)	(.8884)	(.0236)	(.1212)	(1.984)[c]
		1.097		-1.265			-2.286[c]		-2.025[c]		-.341		-1.069	2.512[c]	.170	.107	2.145[c]	1.099	
9		.0860		-.0091		-.0037			-.0328			.0111	-.0298	.3095	-.0153	.1352	.0489	-.0448	2.95
		(.0639)		(.0038)		(.0050)			(.0175)			(.2342)	(.0305)	(.1438)	(.0205)	(.9192)	(.0234)	(.0909)	(1.453)
		1.347		-2.383[c]		-.742			-1.873[d]			.047	-.978	2.153[c]	-.746	.147	2.093[c]	-.493	
10		.1035			.5111		-.0169	-.0063		-.0356			-.0295	.3884	.0013	.2713	.0522	.1303	4.43
		(.0684)			(.0786)		(.0070)	(.0166)		(.1136)			(.0301)	(.1559)	(.0201)	(.9440)	(.0244)	(.1186)	(1.690)[d]
		1.512			.065		-2.421[c]	-.379		-.313			-.984	2.492[c]	.065	.287	2.142[c]	1.099	
11		.0405			-.0317	-.0045			-.0328		-.1875		-.0229	.3286	-.0187	.2597	.0451	-.0441	2.89
		(.0749)			(.0753)	(.0052)			(.0174)		(.1332)		(.0297)	(.1488)	(.0201)	(.9524)	(.0233)	(.0889)	(1.443)
		.540			-.422	-.475			-1.887[d]		-1.408		-.774	2.208[c]	-.929	.273	1.938[d]	-.495	
12		.1158			-.0085		-.0185		-.0342			.1869	-.0321	.4163	.0057	.1119	.048	.1359	6.05
		(.0623)			(.0660)		(.0068)		(.0174)			(.2272)	(.0298)	(.1609)	(.0205)	(.9209)	(.0234)	(.1229)	(1.959)[c]
		1.858[d]			-.128		-2.703[b]		-1.964[d]			.823	-1.076	2.587[c]	.277	.122	2.078[c]	1.106	

Table 5.12 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC	Const.	R^2 (F)
13			.0142	-.0079		-.0003		-.0081		-.0392			-.0283	.2419	-.0205	.1679	.0492	-.0525	3.06
			(.0063)	(.0042)		(.0049)		(.0183)		(.1024)			(.0311)	(.1389)	(.0199)	(.9128)	(.0241)	(.0976)	(1.471)
			2.262[c]	-1.898[d]		-.069		-.442		-.383			-.909	1.742[d]	-1.026	.184	2.047[c]	-.538	
14			.0112	-.0051			-.0151		-.0337		-.0397		-.0321	.4091	.0025	.0205	.0493	.1374	6.74
			(.0069)	(.0039)			(.0074)		(.0176)		(.0176)		(.0302)	(.1746)	(.0211)	(.8879)	(.0273)	(.1242)	(2.076)[c]
			1.637[d]	-1.280			-2.035[c]		-1.916[d]		-.268		-1.062	2.343[c]	.117	.023	2.079[c]	1.107	
15			.0149	-.0083		-.0019			-.0302			.0971	-.0302	.2736	-.0164	.0241	.0470	-.0457	4.10
			(.0066)	(.0038)		(.0050)			(.0180)			(.2468)	(.0304)	(.1491)	(.0203)	(.9096)	(.0233)	(.0902)	(1.637)[d]
			2.254[c]	-2.152[c]		-.372			-1.674[d]			.393	-.995	1.836[d]	-.809	.026	2.019[c]	-.506	
16			.0132		.0082		-.0152	-.0032		-.0414			-.0288	.3757	.0006	.1739	.0516	.1354	5.03
			(.0061)		(.0785)		(.0070)	(.0168)		(.1084)			(.0299)	(.1609)	(.0199)	(.9376)	(.243)	(.1223)	(1.789)[d]
			2.169[c]		.105		-2.165[c]	-.188		-.382			-.959	2.334[c]	.029	.186	2.123[c]	1.108	
17			.0111		-.0297	-.0013			-.0306		-.1378		-.0248	.2917	-.0199	.1756	.0429	-.0436	3.74
			(.0071)		(.0746)	(.0052)			(.0179)		(.1296)		(.0299)	(.1531)	(.0199)	(.9456)	(.229)	(.0880)	(1.579)
			1.569		-.397	-.246			-1.711[d]		-1.063		-.828	1.905[d]	-.999	.186	1.867[d]	-.499	
18			.0148		-.0074		-.0166		-.0330			.2218	-.0309	.4012	.0047	.0102	.0477	.1416	6.69
			(.0065)		(.0663)		(.0070)		(.0179)			(.2401)	(.0295)	(.1677)	(.0203)	(.9246)	(.0233)	(.1268)	(2.068)[c]
			2.276[c]		-.111		-2.371[c]		-1.840[d]			.924	-1.046	2.393[c]	.230	.011	2.042[c]	1.117	
Exp. Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)	(+)		

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

5.4.2 Test of Hypothesis 3 (Operating Leverage)

The coefficients of the operating leverage proxies have been mixed, especially when OL2 (the ratio of fixed assets to total assets) is used. None of the coefficients of OL2 is significant. The coefficients of OL1 (the ratio of total assets to sales) are negative and significant, except in Regressions 8 and 14 where the coefficients are positive and insignificant. Thus, it appears that capital intensity, measured by total assets to sales ratio, is related to the degree of underpricing. The negative and significant coefficients of OL1 in almost all regressions are obviously in contrast to prior expectation. The negative coefficient for operating leverage is not surprising given its negative correlation with financial leverage. The discussions in Section 5.6 show why this contradictory finding occurs. Thus, the hypothesis ($\mathbf{H_3}$) that operating leverage is positively related to the degree of underpricing is rejected.

5.4.3 Test of Hypothesis 4 (Firm Size)

The coefficient of the SIZE variable is in the expected direction as it has a negative association with the degree of underpricing. Size is significantly and negatively related to the degree of underpricing when the issue size (SIZE2) is used in the regressions, while SIZE1 (measured as the natural logarithm of firm sales) is only significant in one of eighteen regressions. This would suggest that the issue size (SIZE2) is a better proxy for firm size rather than sales, at least for the current study. The coefficient of SIZE1 is negative in the multiple regression models, which is in the opposite direction to the results obtained in the univariate analysis. This could be attributed to colliniearity between variables. Thus, the

hypothesis (H_4) that IPO size is negatively related to the degree of underpricing is consistent with the results.

5.4.4 Test of Hypothesis 5 (Firm Growth)

In contrast to the prediction, growth is found to be negatively related to the degree of underpricing. Growth is significant in all possible regressions when the total assets growth is used in the regressions. On the other hand, none of the coefficients of sales growth is significant, suggesting that this measure could be not a good proxy for firm growth with respect to IPO initial returns. Thus, the hypothesis (H_5) that firm growth is positively related to the degree of underpricing is not supported.

5.4.5 Test of Hypothesis 6 (Profitability)

The coefficients for profitability ratios are mixed. This study predicts that profitability is negatively related to the degree of underpricing. The coefficients of profitability ratios are negative only for PRO1 (net operating profit margin) and PRO2 (net profit margin) and only when financial leverage is measured either as FL2 or FL3. In all other regressions the coefficients of the profitability ratios are positive. Profitability is positively and statistically related to the degree of underpricing only for PRO3 (return on total assets) and only when FL1 is used as the proxy for financial leverage. Given the mixed findings on the regression coefficients for profitability, it is difficult to draw inferences regarding their relationship with the degree of underpricing. The lack of significance levels on the coefficient for profitability measures makes inferences ambiguous. However, as two of the proxies have more negative coefficients and also referring back to the findings in the previous section, it can be argued

that the profitability ratio tends to be negatively related to the degree of underpricing. Thus, H_6 is moderately supported.

In summary, it can be argued that the selected accounting risk measures appear to have been able to explain the variation of the degree of underpricing in Indonesian IPOs. However, this conclusion must be treated with caution. The presence of multicollinearity might have impaired the ability to draw conclusions about the significance of each of the accounting risk measures. Taken collectively, the findings allow acceptance of the alternate hypothesis that accounting risk measures are related to the magnitudes of underpricing in Indonesian IPOs. As shown later in the sensitivity analysis, the findings are robust across various measures and alternatives.

Out of five control variables, two variables are found to be statistically related to the degree of underpricing. These are the level of ownership retained by the issuers, and the state of the market. The coefficients for these two control variables are in the expected direction. Although the coefficients of the other three variables are, as expected, neither coefficient is statistically significant.

5.4.6 Test of Hypothesis 7 (Underwriter Quality)

In contrast to the findings of the univariate analysis of a positive relationship between the degree of underpricing and the quality of underwriter, the multivariate test produces a negative but insignificant association. The result is somewhat suggestive that IPO firms with less ex ante uncertainty, or total firm risk, engage relatively prestigious underwriters. Thus, results of the multivariate analysis suggest that the hypothesis of a negative relationship between underwriter quality and the degree of underpricing is not supported (H_7).

5.4.7 Test of Hypothesis 8 (Ownership Retention)

The level of ownership retention (OWN) is positively and statistically significant in fifteen of eighteen regressions. Ownership retention is not significant when the firm sales level (SIZE1) and FL1 (financial leverage is measured as the ratio of total debt to total assets plus the initial market value of equity) are used in the regressions (Regressions 1, 3, and 5). Furthermore, the significance level of ownership retention is much smaller when SIZE1 is included in the regression. The results suggest that the level of ownership retention provides a signal about the quality of the IPO, giving additional support for the signalling model of Leland and Pyle (1977). Thus, the finding of a positive and significant relationship between the level of ownership retention and the degree of underpricing means I cannot reject the hypothesis ($\mathbf{H_8}$).

5.4.9 Test of Hypothesis 9 (IPO Age)

The coefficients of the firms' years in operation (LAGE) are generally in the expected direction; that is, IPO age is negatively related to the degree of underpricing. This suggests that IPO firms with relatively longer operating histories experience a lower degree of underpricing, on average. Negative coefficients are found in ten of the total of eighteen regressions. The coefficients of LAGE are positive only when S2 and PRO3 are included in the regressions. The inconsistencies in the signs of age coefficients may be affected by the presence of high collinearity between independent variables. The collinearity diagnoses in the next section suggest this may be responsible for these inconsistencies. Nevertheless, hypothesis ($\mathbf{H_9}$) that the IPO age is negatively related to the degree of underpricing is not supported.

5.4.10 Test of Hypothesis 10 (Aftermarket Standard Deviation)

In support of prior expectations, the multivariate analysis finds that the aftermarket standard deviation of return is positively related to the degree of underpricing, providing further support for Ritter (1987). This finding is consistent with the initial results of the univariate analysis and also is consistent with Rizka (1995). None of the coefficients, however, is statistically significant at the traditional level. Thus, the hypothesis ($\mathbf{H_{10}}$) that the aftermarket standard deviation of returns is positively related to the degree of underpricing is not supported.

5.4.11 Test of Hypothesis 11 (The State of the Market)

As mentioned earlier, this study finds that the state of the market is positively related to the degree of underpricing. The coefficients are significantly different from zero in all eighteen regressions. This finding supports the result reported in the previous section. Thus, it is evident that IPO firms going public in a bullish period tend to be more underpriced, on average, than their counterparts that go public in bearish periods. This provides further support for the second phenomenon of the IPO market. Hence, this study cannot reject the hypothesis of a positive relationship between the state of the market and the degree of underpricing ($\mathbf{H_{11}}$).

The results for the control variables suggest that IPO firms with lower ex ante uncertainty, or total firm risk, experience a lower degree of underpricing. The negative coefficients for underwriter quality and age, and positive coefficients for retained ownership level and aftermarket standard deviation, confirm the notion that ex ante uncertainty is positively related to firm total risk.

In summary, this study finds that accounting risk measures are of potential use as proxies for ex ante uncertainty and are, consequently, related to the magnitudes of IPO underpricing. Out of five accounting risk proxies examined, two proxies are found to be correlated in the expected direction and thus support the hypotheses (Financial Leverage and Firm Size). Two other variables are correlated in the opposite direction (Operating Leverage and Firm Growth). Conclusions have to be carefully drawn in relation to the coefficient for profitability ratio since the proxies for profitability ratio used in this study produce mixed results. This study finds that in general the coefficients for all of the five control variables are in the expected direction. As shown in Appendix 4, the use of the market adjusted initial return, as the dependent variable, produces a qualitatively similar conclusion. Thus, the results obtained from the model are robust regardless of the dependent variables used in the regressions.

The low adjusted R^2 values, however, raise further questions that other factors could be more related to the extent of Indonesian IPO underpricing. This study finds that, on average, the model explains just below ten percent of the variation of initial returns. Yet, as noted by Beatty and Ritter (1986), ex ante uncertainty proxies would only explain a small part of the cross-section variation of IPOs initial returns. This is because ex ante uncertainty is unobservable. Thus, the success of the model depends heavily on the success in selecting the proxy (Anderson et al., 1995).

5.5 Multicollinearity Diagnoses

Multicollinearity refers to the presence of high degree of correlation between two or more independent variables. Multicollinearity can have harmful effects on multiple regressions, particularly in the interpretation of the results. The presence of multicollinearity

would affect the ability to draw inferences about the significance of individual independent variables. A simple way to detect multicollinearity is to look at the pair-wise relations between independent variables. Other, and more powerful ways of detecting multicollinearity, are by examination of the condition index and variance inflation factors (Hair, Anderson, Tatham & Black, 1995).

As shown in Table 5.10, there are many pair-wise relations which are correlated at statistically significant levels ($p < .01$ or better). Fomby, Hill, and Johnson (1984) suggest that multicollinearity might become a serious problem if the pair-wise correlation is greater than 80%. Although none of the pair-wise correlation coefficients shown in Table 5.10 exceeds the 80% threshold, the presence of many numbers of significantly correlated pairs implies that further investigation is needed.

To detect whether collinearity is present in the regressions, I first examine the extent of the variance inflation factors (VIF). The VIF scores for each variable in the eighteen regressions are provided in Table 5.13. There appears no evidence of multicollinearity in the regression models. Hair et al. (1995) suggests that variance inflation factors above 10 would indicate a problem of collinearity between independent variables. From 18 regressions examined, none of the independent variables has a VIF score above 10. Indeed, none of the independent variables has a score above 2. Thus, the results shown in Table 5.13 suggest that multicollinearity is not present in the regressions examined in this study. To further examine the presence of multicollinearity, the condition indexes and the coefficient variance of proportion of each of the independent variables are examined.

The condition indexes of each of the eighteen regressions are examined. Table 5.14 provides the results of multicollinearity detection based on Regression 1. (See also Appendix 5 for the proportion of variance of coefficient of Regressions 5 and 11 of Table 5.12). Hair et al. (1995) suggest three steps that can be used to diagnose the presence of multicollinearity

(p.153). First, identify all condition indices that have values above the threshold of 30. Second, for all condition indices with the value exceeding the threshold value, identify variables having a variance proportion coefficient above 50%. Finally, collinearity would be indicated if the condition index identified in the first step accounts for a substantial proportion of variance of 90% or greater for two or more coefficients. As shown in Table 5.14, two condition indices (rows 10 and 11) have values that exceed the 30 threshold. Of these two rows, row 11 has two variance values exceeding the 90% threshold (the Intercept and SIZE2). This suggests that there exists collinearity between the SIZE variable and the intercept. Thus, it can be suggested that multicollinearity is present for the data sets. Although not reported, the results of multicollinearity diagnoses using the condition indexes and coefficient of variation for other Regressions are qualitatively similar to those reported here.

Table 5.13

Collinearity Diagnoses Using Variance Inflation Factors for Each of the Eighteen Regressions as Described in Table 5.12

FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. The variance inflation factor (VIF) explains the degree to which each independent variable is explained by the other independent variables. Large VIF values, usually a cutoff threshold of 10 is used, indicate high collinearity (Hair et al., 1995). So, any coefficient with a factor value exceeding 10 denotes a possibility of high collinearity. This collinearity diagnosis is available on SPSS and the coefficients reported here were taken directly from the output of SPSS.

REG	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UW	OWN	LAGE	SDR	MC
1	1.40			1.28		1.39		1.03		1.35			1.16	1.24	1.10	1.06	1.20
2	1.52			1.34			1.33		1.08		1.58		1.13	1.32	1.12	1.11	1.16
3	1.64			1.09		1.43			1.10			1.35	1.16	1.29	1.12	1.09	1.22
4	1.29				1.53		1.33	1.03		1.51			1.13	1.23	1.20	1.10	1.20
5	1.52				1.36	1.40			1.10		1.51		1.16	1.32	1.14	1.08	1.27
6	1.62				1.21		1.35		1.09			1.33	1.14	1.28	1.18	1.12	1.21
7		1.25		1.27		1.28		1.03		1.39			1.18	1.14	1.10	1.06	1.23
8		1.47		1.31			1.28		1.09		1.71		1.14	1.16	1.12	1.11	1.15
9		1.38		1.11		1.33			1.12			1.30	1.18	1.16	1.11	1.08	1.24
10		1.23			1.54		1.30	1.03		1.57			1.14	1.11	1.19	1.10	1.20
11		1.44			1.36	1.32			1.11		1.62		1.18	1.20	1.13	1.07	1.29
12		1.37			1.23		1.27		1.09			1.24	1.14	1.12	1.18	1.12	1.19
13			1.21	1.27		1.26		1.03		1.33			1.17	1.16	1.10	1.07	1.22
14			1.35	1.30			1.28		1.09		1.53		1.13	1.17	1.12	1.12	1.16
15			1.38	1.12		1.33			1.12			1.29	1.17	1.19	1.10	1.09	1.23
16			1.21		1.54		1.29	1.03		1.51			1.13	1.13	1.20	1.12	1.20
17			1.34		1.36	1.31			1.11		1.50		1.17	1.23	1.14	1.08	1.29
18			1.38		1.23		1.27		1.09			1.22	1.14	1.14	1.18	1.13	1.19

Table 5.14

Collinearity Diagnoses Using the Condition Indices and the Decomposition of Coefficient Variance Matrix (Regression 1 of Table 5.12)*

FL1 is measured as total debt / (total assets + initial market value of equity); OL1 is measured as the ratio of total assets to sales; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO2 is measured as (total $assets_t$ – total $assets_{t-1}$) / total $assets_{t-1}$; PRO2 is the ratio of net income after tax to sales; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Values that are boldfaced indicate the possible presence of multicollinearity. The condition index above 30 is indicative of the presence of multicollinearity and the variance of coefficient above .90 in at least two variables on the same row is indicative of the presence of multicollinearity.

Row	Condition Index	Intercept	Proportion of Variance of Coefficient									
			FL1	OL1	SIZE2	GRO2	PRO2	UW	OWN	LAGE	SDR	MC
1	1.000	0.000	0.001	0.003	0.000	0.004	0.002	0.003	0.000	0.001	0.003	0.003
2	3.561	0.000	0.001	0.456	0.000	0.015	0.030	0.068	0.000	0.000	0.037	0.009
3	3.666	0.000	0.000	0.007	0.000	0.663	0.000	0.103	0.000	0.000	0.000	0.049
4	4.376	0.000	0.005	0.020	0.000	0.177	0.000	0.401	0.000	0.002	0.260	0.029
5	5.139	0.000	0.014	0.086	0.000	0.010	0.001	0.280	0.001	0.001	0.428	0.217
6	5.418	0.000	0.027	0.070	0.000	0.088	0.019	0.073	0.001	0.004	0.196	0.520
7	6.435	0.000	0.111	0.296	0.000	0.009	0.569	0.002	0.000	0.000	0.001	0.013
8	10.350	0.001	0.555	0.030	0.001	0.007	0.358	0.000	0.002	0.118	0.039	0.024
9	17.217	0.004	0.164	0.001	0.004	0.021	0.020	0.003	0.086	0.722	0.010	0.044
10	**35.190**	0.035	0.027	0.001	0.046	0.002	0.000	0.033	0.898	0.152	0.007	0.004
11	**107.757**	**0.960**	0.094	0.030	**0.949**	0.004	0.000	0.033	0.012	0.001	0.019	0.087

* Details of the process of detecting multicollinearity can be found in Hair et al. (1995, pp. 152-154).

In summary, the tests for the presence of multicollinearity suggest that collinearity among the independent variables is present. This means that the inferences for the significance levels obtained in the multivariate analysis are impaired by the collinearity problems. Thus, conclusions regarding the significance levels of the variables examined must

be carefully drawn. Further, recall that the adjusted R^2s for the eighteen regressions reported in Table 5.12 vary considerably, with the lowest value being of 1.93% and the highest value being of 12.01%. The evidence also suggests that some accounting variables capture better the variance of initial returns than do others. This obviously has led to greater variance in the adjusted R^2 values. The relatively low adjusted R^2 values indicate that the model does not fully capture the variation of initial returns. Nevertheless, the evidence of significance levels might suggest that accounting risk measures examined in this study are related to the extent of Indonesian IPO underpricing.

5.6 Sensitivity Analyses

Recall that this study considers the effect of negative GROWTH on the degree of underpricing. Two possible remedies for addressing the effect of negative growth on the extent of initial return are proposed: (1) assigning zero growth, or (2) taking the absolute value for firms with negative growth. Recall, also, that there might be bias in the determination of the quality of the underwriter, as this study follows Rizka (1995) who assigned an underwriter as a top quality underwriter if they fell in the first bracket of those underwriters engaging as lead underwriters on least ten occasions. There is no specific justification of the determination of high and low underwriter quality in Rizka. Thus, other determinations on the quality of underwriter are possible. To examine the sensitivity of the determination between high and low quality underwriters, I assign an underwriter as being prestigious if it falls in the first top five most frequently underwriting the issues. In this section, I examine the effects of change on the significance levels of the regression analysis after adjustments were made on the GROWTH variables and the quality of the underwriter.

I perform similar regressions as in Table 5.12 using the new GROWTH variables. The first sensitivity test I perform is changing the negative Growth to zero. The results are qualitatively unchanged. Even the t-statistics for the GROWTH variables are much smaller than those reported in Table 5.12. The adjusted R^2s and also the significance levels of the regressions are not statistically affected by the changes. For example, the t-statistic of GROWTH1 in Regression 1 is unchanged, as the new regression produces a t-statistic value of -0.313 compared to -0.314 in the initial model. A similar conclusion of an unaffected significance level is obtained when the absolute value is used as a replacement for negative growth. For example, the t-statistic for Growth variables (GROWTH2) in Regression 18 is down to −1.818 compared to −1.840 reported in the initial model. Thus, it has been shown that transformation of the GROWTH variables does not alter the results obtained from the initial model.

The adjusted R^2s of the regressions and the coefficients of the significance level are improved slightly, on average, when the Underwriter quality variable is replaced by the new definition. For example, the adjusted R^2 value of Regression 1 becomes 8.79% compared to 8.44% in the initial model. The t-statistic for underwriter quality is improved to −1.345 compared to -0.905 in the initial model. The results are even more promising in regressions employing FL2 and FL3 as the proxies for financial leverage. For example, out of six possible regressions employing FL2 as the proxy for financial leverage, the coefficients for underwriter are significant at the 10% level in three regressions when SIZE2 is used as the proxy for firm size. Similar results are obtained when FL3 is used as the proxy for financial leverage. Thus, other things being equal, it appears that the determination of the quality of the underwriter affects the explanatory power of the underwriter quality variable on the degree of underpricing. This preliminary conclusion, however, must be treated with caution. That is, the reason why the coefficient of underwriter quality is significant in the regression employing

FL2 and FL3 and S2 and not in the regression employing FL1 when most of the regressions using FL1 are found to be statistically significant remains unexplained. Again, collinearity between variables may be responsible.

Recall also on the possibility of outliers, which could affect the regression coefficients (Refer to Table 5.2). The variable that most probably has an outlier is OL1. One of the sample firms has OL1 ratio of 2,107.0. Recall that OL1 has a minimum value of 0.28 and a median of 0.15 with mean value of 1.59. The 2,107.0 certainly is a potential candidate for an outlier. An outlier could have been influential, or may have had no effect on the regression. To test this possibility, I re-run the regressions by excluding the firm having this extreme value. The results are generally similar to the findings reported in Table 5.12. The only effect of the exclusion of this firm is that the coefficients of OL1 previously found to be significant become insignificant, but the regression coefficients are not affected. Thus, it appears that the outlier that was found in variable OL1 has a significant effect only on the variable itself, but not on the other variables or the overall regressions.

5.7 Discussions

It has been shown that, despite the presence of multicollinearity in the model, the accounting risk measures examined in this study are related to the extent of Indonesian IPO underpricing. The presence of multicollinearity has made inferences about the significance of individual coefficients difficult. However, the R^2 statistics are unaffected by the presence of multicollinearity (Kennedy, 1985). Thus, the results reported in this study are statistically valid.

This study finds that three accounting risk proxies (that is, financial leverage; firm size; and firm growth) are constantly and statistically related to initial return. In particular,

FL1 (measured as the ratio of total debt to total assets plus the initial market value of equity), SIZE2 (measured as a natural logarithm of the issue size), and GRO2 (measured as total assets growth) are highly significant. The other two accounting risk proxies (that is, operating leverage; profitability) are less convincingly related to the degree of IPO underpricing.

This study predicted a positive relationship between both financial and operating leverages and the degree of underpricing. The results give support for only financial leverage but not operating leverage. Operating leverage is negatively related to the degree of underpricing. There is no study examining the combined effect of financial and operating leverages on the extent of IPO underpricing. The existing literature suggests that operating leverage is negatively related to firm risk, while financial leverage is positively related to firm risk (Mandelker & Rhee, 1984). Mandelker and Rhee use the firm's systematic risk as a proxy for firm risk. This relationship is not surprising given that "the firm's decision on operating leverage can be offset by its decision on its financial leverage" (p.54). Thus, there appears an inverse relationship on the firm's risk between the effects of financial and operating leverages. The pair-wise correlation between financial and operating leverage provides support for the view that these leverage proxies are inversely related to each other. The correlation coefficients of these leverage measures are negative with some coefficients being statistically significant at the 1% level (See Table 5.10). The evidence reported in Tables 5.12 through 5.16 also reveals that when financial leverage has a positive coefficient, operating leverage has a negative coefficient and vice versa. It is unclear, however, whether this inverse relationship is in support of Mandelker and Rhee, or that the specification or variable measurement error is responsible. Whilst the measures of financial leverage are consistent with previous studies, there might be other proper or correct measures of operating leverage. Given data limitation, the measures of operating leverage used in this study might be reasonable.

In summary, it has been the case that financial leverage will always be negatively related to operating leverage. Thus, it has also been clear why this study does not find support for the prediction of a positive relationship between operating leverage and the degree of underpricing. The nature of an inverse relationship between financial and operating leverages has contributed to the inability of the current study to predict a positive association between operating leverage and the degree of underpricing, as financial leverage has been found to be positively and statistically related to the degree of underpricing.

The strong evidence on the relationship between financial leverage, particularly FL1, and initial returns supports the previous evidence suggesting that financial leverage is one of the potential risk determinants. This positive relationship is in support of Anderson et al. (1995) who, based on their literature survey, assert that a larger initial return is related to a firm's excessive reliance on debt financing. This finding, however, is in sharp contrast to Hedge and Miller (1996) who find a negative and significant association. This opposite finding could have been attributed to a difference in perspective. The current study argues that financial leverage is a measure of risk. On the other hand, Hedge and Miller rely on a signalling hypothesis. They argue that issuers use the presence of debt financing in pre-IPO as a credible signal that the firm is a high quality one given that larger debt will increase the expected return on equity. The distinction of whether financial leverage is a risk measure or signal of firm quality is still unclear. Since these studies use qualitatively similar measures of financial leverage (FL1), the results should be not too different. One possible explanation of the positive relationship found in the current study is that debt is a concern in Indonesian corporations. A survey conducted on large Indonesian listed companies reveals that most of the firms are concerned about their debt level because debt is seen as a measure of risk which will affect the firm's ability to obtain external funds (Ang, Fatemi, & Tourani-Rad, 1997). Also, empirically, financial leverage is found to be positively related to the systematic risk of

Indonesia common stocks (Hanafi, Purwanto, & Halim, 1995; Tandelilin, 1997a, 1997b). Thus, the finding reported in the current study suggests that financial leverage is a proxy for firm risk, not a signal of quality.

The current study also documents that the relationship between financial leverage measures and initial returns varies considerably. FL1 (measured as the ratio of total debt to total assets plus initial market value of equity) has the highest correlation compared to the other two measures (FL2 and FL3), and even FL1 is significant in all regressions. This high correlation is seen as being related to how financial leverage is measured. The inclusion of the market value will better reflect the actual assets of the firm. This is in line with the suggestion in the literature that the use of market value in the assessment of financial leverage as risk determinant is theoretically and empirically stronger than are book values (Ryan, 1997). Hedge and Miller (1996) also use the measure similar to FL1 used in the current study and find their financial leverage is positively and significantly related to the degree of underpricing. Thus, it is not surprising that FL1 is related more strongly to the IPO initial returns than the other two financial leverage measures (FL2 and FL3).

Consistent with previous studies, the current study finds that the firm's issue size (gross proceeds) is negatively and statistically related to the extent of IPO underpricing. As can be seen in Table 3.5, most of the existing studies find a negative and significant relationship. A less convincing association is documented when the firm's size is proxied by sales or total assets. For Indonesian IPOs, the firm's issue size appears to be a more appropriate proxy for firm size given the nature of the market. It has been the case that the Indonesian stock market is considered to have low liquidity, and to be a small market (Husnan & Theobold, 1990; Husnan, 1994; Roll, 1994). This low liquidity is mainly attributed to fewer stocks available in the issue market. An attractive IPO with few stocks available for offer will give rise to greater underpricing, as rationing will occur when demand

exceeds supply. Thus, it can be argued that the available shares, and thus the size of the issue, are more appropriate proxies for firm size in an IPO setting.[1]

5.8 Additional Analyses

Two additional analyses are performed. First, the model is tested on the firms partitioned on the basis of the periods in which they went public. It has been shown that a significant difference in the variation of initial returns exists between IPOs that went public in the hot and cold periods. Thus, to test whether the model is sensitive to the period of going public, two periods are then considered: the bullish and bearish periods. Second, the external validity of Klein (1996) and Kim et al (1995a) is examined. As shown earlier, these two studies examined the pricing of IPOs. Klein, in particular, provides evidence that her model is successful in predicting the offer price and aftermarket price of an IPO, giving support on the assertion that accounting information is value relevant about the IPO.

5.8.1 Underpricing and the State of the Market

As shown earlier, the Indonesian IPO market has also experienced the so-called cycle in volume (i.e., the year when more IPOs flood into the market). In this section I will conduct sensitivity analyses to examine whether the risk associated with the IPO firms is different between the two regimes: the bullish and bearish periods.

The first test I perform is to re-run the multivariate tests by regressing all the independent variables over the initial return for each of the state of the market. The market

[1] I also run a regression employing the natural logarithm of the number of shares offered as the proxy for firm size. The results suggest that the significance level of this proxy is qualitatively similar to that obtained using the gross proceeds. The coefficients of this proxy remain negative in all of the possible regressions. The number of shares is negatively related to the degree of underpricing (the correlation coefficient is 24.67% with $p < .001$).

condition variable is accordingly eliminated from the regression as it has a single binary value. Thus, the regression takes only eight independent variables. Table 5.15 provides the results of the multivariate analyses for firms that made IPOs during the bullish periods. Because homoscedasticity is rejected at the 1% level in all regression, White's (1980) heteroscedasticity consistent covariance matrix estimators are used to estimate the t-statistics and standard errors. Altogether there are nine regressions. The coefficients of the accounting risk measures are unchanged. The adjusted R^2s are considerably higher than the ones obtained in the initial model, giving support that the model might have been more robust when it is applied to the situation of more firms that made IPOs.

As shown in the Table 5.15, three accounting variables (that is, FL1; S2; GRO2) are significantly related to the extent of initial returns. FL1 has a consistent and significant positive relationship with initial returns, whilst the two other measures do not always have significant relationships. For example, FL3 is significant in two of three regressions. None of the coefficients of FL2 is statistically significant.

Consistent with earlier findings, size is negatively related to initial returns. The coefficient of operating leverage and growth is negative. The growth proxy is significantly related to initial return only when the growth of total assets (GRO2) is used in the regressions. Profitability measures have a mixed relationship with initial returns. PRO3 is moderately significant in one of three regressions.

For the control variables, it is found that only the ownership retention variable is statistically related to the extent of initial returns with a positive relationship (p values range from .10 to .05), which is consistent with the findings in the earlier section and also in the predicted direction. Consistent with the expectation, underwriter quality is negatively related to initial excess return. Also the aftermarket standard deviation is, as predicted, positively

related to initial returns. The coefficient of the age variable is somewhat unpredictable as it has both negative and positive coefficients.

The overall results reported in Table 5.15 suggest that the selected accounting risk measures are considerably related to the extent of initial excess returns giving support to the findings shown in the previous section. The higher adjusted R-square values may suggest that the model is better fitted during the bullish periods than the whole periods covered in this study. However, it is still difficult to make the assertion that initial IPO market investors do engage in more realistic valuations. One may argue that investors who crowd into an IPO, when more IPOs enter the market, are driven by their desire to obtain abnormal returns instead of as a means of making rational investment.

Table 5.15

Multivariate Tests of Raw Initial Returns on Continuous Variables for Firms that Made IPOs during Bullish Periods: 1989, 1990, 1993, 1994 (n=96)

The raw initial return is measured as the difference between the first day closing price and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Standard errors (in parentheses) are adjusted for White's (1980) heteroscedasticity consistent covariance matrix.

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	Const.	R^2 (F)
1	.4773			-.0079		-.0098		-.0233		.0196			-.0126	.2433	-.0034	.9892	-.0095	12.54
	(.1700)			(.0051)		(.0059)		(.0289)		(.1065)			(.0524)	(.1721)	(.0239)	(.9610)	(.0665)	(2.529)[c]
	2.808[b]			-1.561		-1.669[d]		-.806		.184			-.239	1.413	-.143	1.029	-.143	
2	.4326			-.0057			-.0192		-.0559		.1014		-.0151	.3880	.0184	.6549	.0858	17.56
	(.1626)			(.0043)			(.0078)		(.0278)		(.1395)		(.0501)	(.1948)	(.0262)	(.9053)	(.0874)	(3.271)[b]
	2.661[b]			-1.327			-2.463[c]		-2.009[c]		.727		-.302	1.991[c]	.703	.725	.982	
3	.4706				-.0632		-.0187		-.0533			.4707	-.0157	.3709	.0164	.6949	.0639	18.97
	(.1491)				(.0881)		(.0073)		(.0287)			(.2696)	(.0473)	(.1847)	(.0271)	(.9516)	(.0753)	(3.496)[a]
	3.156[b]				-.718		-2.570[c]		-1.858[d]			1.746[d]	-.331	2.008[c]	.604	.730	.849	
4		.1289		-.0071		-.0059		-.0488		-.0896			-.0089	.3950	-.0095	1.0768	-.0792	1.39
		(.0942)		(.0047)		(.0074)		(.0323)		(.0148)			(.0488)	(.2061)	(.0262)	(1.083)	(.1145)	(1.151)
		1.369		-1.517		-.796		-1.511		-.604			-.183	1.916[d]	-.361	.994	-.692	

Table 5.15 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	Const.	R^2 (F)
5		.1163		-.0024			-.0240		-.0603		-.1274		-.0177	.6511	.0220	.6548	.1049	9.40
		(.0967)		(.0040)			(.0089)		(.0291)		(.1853)		(.0462)	(.2506)	(.0283)	(.9580)	(.1022)	(2.107)[c]
		1.202		-.598			-2.704[b]		-2.075[c]		-.688		-.383	2.599[c]	.779	.684	1.027	
6		.1468			-.0757		-.0224		-.0339			.0221	-.0170	.5950	.0089	1.0372	.1021	6.69
		(.0934)			(.1194)		(.0083)		(.0344)			(.1539)	(.0461)	(.2430)	(.0269)	(1.049)	(.1014)	(1.765)[d]
		1.572			-.634		-2.712[b]		-.987			.144	-.369	2.448[c]	.334	.989	1.007	
7			.0146	-.0066		-.0033		-.0040		-.0959			-.0083	.3784	-.0121	.9261	-.0754	2.22
			(.0068)	(.0059)		(.0075)		(.0318)		(.1345)			(.0494)	(.2082)	(.0261)	(1.095)	(.1119)	(1.242)
			2.138[c]	-1.370		-.447		-1.265		-.713			-.167	1.814[d]	-.464	.946	-.674	
8			.0097	-.0021			-.0219		-.0580		-.1685		-.0147	.6550	.0195	.6019	.1089	9.943
			(.0075)	(.0042)			(.0093)		(.0288)		(.1773)		(.0466)	(.2583)	(.0286)	(.9925)	(.1051)	(2.11)[c]
			1.292	-.496			-2.361[c]		-2.017[c]		-.951		-.315	2.536[c]	.682	.606	1.036	
9			.0127		-.0879		-.0211		-.0582			.1174	-.0154	.6447	.0146	.6533	.1053	9.55
			(.0073)		(.1010)		(.0084)		(.0309)			(.3049)	(.0453)	(.2500)	(.0287)	(1.072)	(.1034)	(2.126)[c]
			1.744[d]		-.871		-2.514[c]		-1.887[d]			.384	-.341	2.579[c]	.508	.609	1.019	
Exp. Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)		

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

Unlike the results reported in Table 5.15, which are consistent with the results of the full sample, Table 5.16 shows, to a certain extent, an opposite finding. Although all the regressions are significant, some of the variables have adverse signs, and some even become insignificant. Interestingly, the adjusted R^2s are considerably higher than the ones obtained in the earlier regressions. The adjusted R^2s vary from 13.03% to 19.98%, which means that the model explains the variation of initial return better than the initial model of the full sample. However, a close examination reveals that the control variables, not the accounting variables, are responsible for this high correlation. This indicates that accounting variables do not explain much of the variation of initial returns in situations where few firms make an IPO.

From five accounting risk proxies, only the SIZE1 measure is significantly related to the extent of initial return, with a positive relationship. The finding of a positive relationship of SIZE1 is surprising given that earlier regressions find a constant negative and insignificant relationship. The financial leverage measures show a mixed relationship. While FL1 provides a positive relationship to initial return, the other two measures of financial leverage (FL2 and FL3) are negatively related. A similar finding is reported for the profitability measures, with PRO3 as the only proxy that is moderately significant ($p < .10$). The growth variable is still negatively related to initial return, but neither measure is significant.

For the control variables, two variables (that is, underwriter quality and aftermarket standard deviation) are found to be strongly related to the extent of initial excess returns. As shown in Table 5.16, the coefficients of underwriter quality are all negative and significant at the 5% level. This result raises some questions, namely, whether during bearish periods the IPO firms become more selective in choosing the underwriters so as to avoid possible underpricing or simply because market participants rely more on signalling variables. Yet, it is also unclear whether this incident is purely caused by the IPO issuers' attempt to avoid

underpricing by selecting more prestigious underwriters, or it is the low market responses that drives the underpricing to a lower level. Note that during these periods the average raw initial return is 5.52% compared to 11.66% for the bullish periods (the mean is significantly different between each other, $t = 2.488$, $p < .01$).

In contrast to earlier findings, the coefficients of aftermarket standard deviation are negative and significant. This suggests that during bearish periods, IPO firms with greater aftermarket standard deviation are less underpriced than are the firms with lower aftermarket standard deviation. This finding is in contrast to the prediction of a positive relationship. The coefficients of ownership retention are mixed. The coefficients are negative when the regressions use FL1 as the proxy for financial leverage and are positive for other financial leverage proxies. The age variable has a negative relationship with initial excess returns, which is consistent with the prediction. Yet, none of the coefficients is significant.

Overall, the results presented in Table 5.16 indicate that during bearish periods the control variables appear to explain most of the variation of IPOs initial returns. This finding could be interpreted as meaning that the regression model proposed in this study, in particular the accounting risk measures, does not fully explain the extent of initial returns in the bearish periods. In other words, accounting risk proxies appear to be a noisy, if not a good, proxy for ex ante uncertainty, and, thus, the risk of Indonesian IPO firms when fewer firms are making IPOs.

Table 5.16

Multivariate Tests of Initial Returns on Continuous Variables for Firms that Made IPOs during Bearish Periods: 1991, 1992, 1995, 1996, 1997 (n=53)

The raw initial return is measured as the difference between the first day closing price and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Standard errors (in parentheses) and t-statistics are adjusted for White's (1980) heteroscedasticity consistent covariance matrix.

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	Const.	R^2 (F)
1	.0571			.0069		.0134		-.0031		.0611			-.0674	-.1474	-.0387	-2.7639	.0133	17.86
	(.0727)			(.0147)		(.0503)		(.0309)		(.1160)			(.0255)	(.1722)	(.0278)	(1.078)	(.0212)	(2.280)[c]
	.786			.470		2.669[c]		-.101		.527			-2.645[c]	-.856	-1.393	-2.564[c]	.626	
2	.1309			-.0019			.0093		-.0064		.2589		-.0696	-.1001	-.0348	-2.6326	.0428	15.87
	(.0873)			(.0183)			(.0049)		(.0188)		(.1845)		(.0266)	(.1820)	(.0281)	(1.079)	(.449)	(2.111)[c]
	1.500			-.109			1.896[d]		-.341		1.403		-2.612[c]	-.550	-1.241	-2.440[c]	.953	
3	.1583				.0839		.0069		-.0017			.3922	-.0700	-.0910	-.0322	-2.6904	.0359	19.98
	(.0861)				(.0569)		(.0052)		(.0167)			(.2341)	(.0260)	(.1780)	(.0292)	(1.027)	(.0386)	(2.462)[c]
	1.837[d]				1.476		1.338		-.099			1.675[d]	-2.693[c]	-.511	-1.103	-2.619[c]	.930	
4		-.0282		.0088		.0146		-.0047		.0172			-.0645	-.1110	-.0414	-2.7788	.0077	17.37
		(.0704)		(.0149)		(.0052)		(.0306)		(.1214)			(.0268)	(.1587)	(.0276)	(1.086)	(.0178)	(2.238)[c]
		-.401		.588		2.830[b]		-.155		.141			-2.403[c]	-.699	-1.500	-2.559[c]	.432	

Table 5.16 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	Const.	R^2 (F)
5		.0083		.0068			.0076		-.0115		.1103		-.0697	.0143	-.0337	-2.5582	.0459	13.03
		(.0894)		(.0171)			(.0045)		(.0205)		(.1954)		(.0285)	(.1546)	(.0286)	(1.124)	(.0479)	(1.882)[d]
		.093		.398			1.682[d]		-.561		.564		-2.446[c]	.093	-1.181	-2.276[c]	.958	
6		.0122			.0932		.0058		-.0076			.1149	-.0703	.0435	-.0339	-2.5821	.0404	15.89
		(.0855)			(.0597)		(.0052)		(.0193)			(.2453)	(.0268)	(.1564)	(.0289)	(1.102)	(.0428)	(2.112)[c]
		.143			1.562		1.129		-.396			.469	-2.623[c]	.278	-1.172	-2.343[c]	.944	
7			-.0076	.0083		.0144		-.0068		.0072			-.0638	-.0936	-.0435	-2.8136	.0068	17.87
			(.0095)	(.0150)		(.0049)		(.0296)		(.1175)			(.0257)	(.1705)	(.0291)	(1.063)	(.0168)	(2.282)[c]
			-.803	.552		2.925[b]		-.230		.061			-2.480[c]	-.549	-1.493	-2.647[c]	.403	
8			-.0063	.0079			.0079		-.0146		.0497		-.0678	.0434	-.0344	-2.6348	.0443	13.34
			(.0124)	(.0166)			(.0449)		(.0202)		(.1839)		(.0269)	(.1698)	(.0299)	(1.102)	(.0463)	(1.913)[d]
			-.503	.475			1.752[d]		-.723		.270		-2.524[c]	.256	-1.150	-2.391[c]	.955	
9			-.0034		.0912		.0062		-.0104			.0595	-.0691	.0626	-.0345	-2.6377	.0699	15.98
			(.0116)		(.0579)		(.0049)		(.0186)			(.2329)	(.0262)	(.1685)	(.0302)	(1.078)	(.0426)	(2.120)[c]
			-.295		1.573		1.254		-.559			.256	-2.638[c]	.371	-1.144	-2.446[c]	.929	
Exp. Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)		

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

5.8.2 Prospectus and the Pricing of IPOs

As mentioned in Chapter Four, this study will also provide an additional analysis of the usefulness of accounting information in the pricing of IPOs. This analysis is important in order to understand further the relationship between accounting information and the pricing of IPOs. The finding is expected to complement the main issue examined in the current study. The analysis is based on the works of Kim et al. (1995a) and Klein (1996) who empirically show that accounting information provided in the issue prospectus is related to the offer price and market price of an IPO. Thus, this section examines whether information in the issue prospectus is value relevant to the IPO.

Table 5.17 provides the results of the multivariate analysis. For comparison purposes, two regressions: the first is equation 4.2 and the second is a modified one, are provided. Because White's test rejects homoscedasticity at the 5% level in all four regressions, the significance levels of the parameter estimates are adjusted for White's (1981) heteroscedasticity consistent covariance matrix. Panel A presents evidence that the pre-IPO accounting information is related to the pricing of IPOs. The IPO issue price is positively and significantly related to earnings per share, price to book value of equity, and gross proceeds of the issue and is negatively related to the level of financial leverage (as risk measure). The signs for all accounting variables are in the expected direction. Thus, IPO firms having higher issue prices, on average, tend to have higher earnings per share, price to book value of equity, gross proceeds, and lower risk. This finding is qualitatively similar to both Klein (1996) and Kim et al. (1995a).

The signals taken by the issuers appear to be impounded into the pricing of the IPO. The quality of underwriter is positively and insignificantly related to the price of the issue. The prior view was that IPOs underwritten by prestigious underwriters offer relatively higher

prices than IPOs underwritten by less prestigious underwriters, and, would be more valued. However, the lack of a significant association makes such an assertion unwarranted in the context of this study. The evidence also suggests that the higher the fraction of ownership held by the initial issuers, the higher is the price of the IPO ($p < .001$). The positive and significant relationship between the level of ownership retention and the issue price found in the current study supports the Leland and Pyle's (1977) signalling hypothesis. Industry membership does not appear to be an influential variable. The coefficients of IPO age are positive, but insignificant, in both regressions.

The market model generates similar conclusions as the offer price model (Panel B of Table 5.17). The market price model is based on the first week's closing price. The only difference is that the risk variable is no longer significant. Price differences may have affected the influencing factor of risk. The mean aftermarket price of Rp. 5,852.5 is significantly higher than the offer price of Rp. 5,336.4 ($t=1.2866$, $p < .10$), but the variance difference is insignificant ($F= 0.8209$, $p < .1156$). Nevertheless, the general conclusion is similar to the offer price model in that accounting information is value relevant in pricing in the new issues market.

Table 5.17

Multivariate Tests of Offering Price and Market Price on Continuous Variables (n=149)

Dependent variables are the offer price measured as the natural logarithm of the offer price and market price measured as natural logarithm of the market closing price of week one. The independent variables are EPS which is the pre-offering earning per share for the latest fiscal year and is expressed in natural logarithm; PBV is the post-offering book value of equity per share; α is the percent of equity retained by the initial issuers; underwriter quality (UWQ) is a dummy variable and takes a value of one if the issue is underwritten by prestigious underwriter and zero otherwise; industry membership is measured according to the firm's industry classification; LGP is the natural logarithm of gross proceeds of the issue; LAGE is the natural logarithm of the firm's years in operation; FL is the firm's financial leverage measured as the ratio of total debt to total assets plus initial market value of equity. Standard errors (in parentheses) are adjusted for White's (1980) heteroscedasticity consistent covariance matrix.

Dependant Variable	CONST.	LEPS	PBV	LGP	FL	UWQ	OWN	LAGE	IND	R^2 (F)
Panel A: Issue Price										
Regression 1	.6040	.8866	.0479	.0639	-.4452	.0878	1.5289	.0642	.0141	88.27
	(.5175)	(.0417)	(.0258)	(.0205)	(.1859)	(.0817)	(.2943)	(.0554)	(.0119)	(141.216)[a]
	1.167	21.25[a]	1.857[d]	3.119[b]	-2.395[c]	1.075	5.195[a]	1.161	1.178	
Regression 2	.6325	.8878	.0476	.0635	-.4119	.0869	1.5665	.0642		88.26
	(.5377)	(.0420)	(.0269)	(.0211)	(.1875)	(.0819)	(.2878)	(.0552)	-	(160.988)[a]
	1.176	21.13[a]	1.769[d]	3.010[b]	-2.196[c]	1.060	5.443[a]	1.161		
Panel B: Market Price										
Regression 1	.8082	.8894	.1017	.0434	-.2035	.0742	1.7211	.0667	.0177	85.56
	(.6883)	(.0501)	(.0338)	(.0260)	(.2123)	(.0914)	(.3622)	(.0642)	(.0131)	(111.321)[a]
	1.174	17.74[a]	3.013[b]	1.667[d]	-.959	.813	4.752[a]	1.039	1.348	
Regression 2	.8439	.08909	.0101	.0429	-.1617	.0730	1.7683	.0666		85.51
	(.7134)	(.0504)	(.0357)	(.0267)	(.2148)	(.0914)	(.3517)	(.0641)	-	(126.589)[a]
	1.183	17.68[a]	2.836[b]	1.603	-.753	.799	5.027[a]	1.039		
Expected sign		(+)	(+)	(+)	(-)	(+)	(+)	(+)	(?)	

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

Table 5.18

Pearson Correlation between Offering Price and Market Price and Continuous Variables

LPR is natural logarithm of the offer price measured; LPW is the natural logarithm of the market closing price of week one; LEPS is the natural logarithm of pre-offering earning per share for the latest fiscal year; PBV is the post-offering book value of equity per share; OWN is the percent of equity retained by the initial issuers; underwriter quality (UWQ) is a dummy variable and takes a value of one if the issue is underwritten by a prestigious underwriter and zero otherwise; industry membership is measured according to the firm's industry classification; LGP is the natural logarithm of gross proceeds from the issue; LAGE is the natural logarithm of the firm's years in operation; FL is the firm's financial leverage measured as the ratio of total debt to total assets plus initial market value of equity. All tests are two tailed-tests.

	LPR	LPW	LEPS	PBV	LGP	RISK	UWQ	OWN	LAGE	IND
LPR	1.000									
LPW1	0.977[a]	1.000								
LEPS	0.892[a]	0.866[a]	1.000							
PBV	0.240[b]	0.295[a]	0.198[c]	1.000						
LGP	-0.016	-0.094	0.015	0.098	1.000					
RISK	-0.145	-0.075	-0.114	0.085	-0.246[b]	1.000				
UWQ	0.360[a]	0.361[a]	0.363[a]	0.066	-0.188[c]	0.113	1.000			
OWN	0.298[a]	0.325[a]	0.229[b]	0.115	-0.121	0.369[a]	0.215[b]	1.000		
LAGE	0.002	-0.012	-0.016	0.068	0.200[c]	-0.055	-0.059	-0.147	1.000	
IND	-0.002	0.022	-0.020	0.005	-0.201[c]	0.187[c]	0.029	0.118	-0.059	1.000

[a, b, c,] denote coefficient as being significantly different from zero at the 0.001, 0.01, and 0.05 levels, respectively.

The results of multicollinearity diagnoses suggest that the models may have been affected by the presence of collinearity between independent variables. While the variance inflation factors (VIF) diagnoses do not indicate the presence of collinearity among independent variables, results based on the condition index and variance proportion coefficients strongly indicate the present of multicollinearity. In particular, variable gross proceeds and the regression's intercept both have variance proportion coefficients greater than 90%, well above the threshold benchmark of 50% (Refer to the multicollinearity diagnosis steps in Section 5.5). Condition indexes of 33.9 and 102.0 for rows eight and nine, respectively, also indicate the presence of multicollinearity. Although multicollinearity does not affect the significance of the coefficients, its presence would affect the interpretation of the findings. Thus, the findings of significant relationships between selected accounting variables and the pricing of the IPOs must be interpreted carefully.

To test the predictive ability of the models, fitted values of offer prices and market price are estimated for non-sample of IPO firms from the initial sample firms that do not meet the selection criteria and are those that went public in period 1992-1995. There are thirteen firms with available data that are selected arbitrarily to test the models. Table 5.19 provides the results of the forecast error both for the offering price and the market models. The mean forecast errors for the offering price and market model (not reported in the Table) are –9.14% and –6.94%, respectively. Both means are insignificantly different from zero. The median forecast errors for the offering price and the market model are –0.36% and –3.95%, respectively. The null hypotheses that the median forecast errors for both models are equal to zero can not be rejected at the 5% level (two-tailed) under the Wilcoxon signed-rank test.

Table 5.19

Comparisons of Predicted and Actual Prices for Non-Sample IPO Firms (n=13)

No.	Company Name	Offering Date	Projected Price(Rp)	Offer Price (Rp)	Error	Forecast Error (%)	Projected Price (Rp)	Price at Week 1 (Rp)	Error	Forecast Error (%)	Industry Code
1	PT. Plaza Indonesia Raya	15-Jun-'92	5,396	4,950	446	09.00	6,477	5,000	1,477	29.53	91-99*
2	PT. Barito Pacific T	01-Oct-'93	5,567	7,200	-1,633	-22.68	5,984	7,200	-1,216	-16.89	31-39
3	PT. Mulia Industrindo	17-Jan-'94	4,507	3,800	707	18.59	5,698	3,800	1,898	49.95	31-39
4	PT. Mas Murni Indonesia	09-Feb-'94	1,401	2,700	-1,299	-48.11	1,497	2,700	-1,203	-44.56	91-99*
5	PT. Enseval Putra Mega	01-Aug-'94	5,480	5,500	-20	-00.36	6,508	5,500	1,008	18.32	91-99*
6	PT. Indosat	19-Oct-'94	8,210	7,000	1,210	17.29	8,406	7,000	1,406	20.08	71-79
7	PT. Jeewon Jaya Ind.	20-Dec-'94	3,167	4,500	-1,333	-29.62	3,198	4,500	-1,302	-28.93	31-39
8	PT. Citra Marga Nusapala	10-Jan-'95	1,859	2,600	-741	-28.49	2,093	2,600	-507	-19.50	71-79
9	PT. Telaga Mas Pertiwi	26-Jan-'95	1,145	1,350	-205	-15.19	1,135	1,350	-215	-15.89	21-29
10	PT. Hexindo Adiperkasa	13-Feb-'95	2,682	3,900	-1,218	-31.22	2,885	3,900	-1,015	-26.03	91-99*
11	PT. Bimantara Citra	17-Jul-'95	1,306	1,250	56	4.48	1,508	1725	-217	-12.58	91-99*
12	PT. Tambang Timah	19-Oct-'95	3,011	2,900	111	3.81	3,185	2,900	285	9.84	21-29
13	PT. Telekomunikasi Ind.	14-Nov-'95	2,126	2,050	76	3.70	2,041	2,050	-9	-0.45	71-79
	Median Forecast Error (%)[a]					-.36				-3..95	
	P-Value (Median FE=0)[b]					0.05				0.05	

[a] Forecast error (%) = (PP – AP)/AP, where PP is predicted price and AP is actual price. AP takes either offering price or market price at week one.

[b] The Wilcoxon signed-rank test was performed to test that the null hypothesis that the median of forecast error is not different from zero (two tailed).

The non-sample firms are drawn from the initial sample firms that do not meet the selection criteria used in the analysis. The firms are restricted to those that went public during 1992-1995.

Industry classification is defined as follows: 21-29 for mining, 31-39 for basic industry and chemical, 71-79 for infrastructure, utility, and transportation, and 91-99 for trade and services.

* This excludes companies in the 98 code, which is the investment company. PT stands for Perseroan Terbatas (Property Limited or Pty. Ltd.).

Table 5.20 provides the test statistics for the accuracy of the predicted prices. The correlations between actual and predicted offer prices, and between actual and predicted market prices, are 91.26% and 84.59%, respectively. The high correlation coefficients for the predicted and actual prices for both models provide further support for the accuracy of the models. The predictive ability of the offering price model appears to be stronger than for the market price model. The relatively weaker predictive ability of the market price model is also indicated by the sum of squared forecast errors which is 2.57 times greater than for the offering price. This finding confirms the assertion that the models are successful in predicting both the offering prices and market prices.

Table 5.20

Test Statistics for Accuracy of Predicted Offer and Market Prices
for Non-Sample Firms as in Table 5.20 (n=13)

	Offering Price	Market Price
Correlation coefficient (PP, AP)[a]	.9126	.8459
P-value (Correlation = 0)[b]	(.001)	(.001)
α_0[c]	903.13	545.78
t-statistic ($\alpha_0 = 0$)[c]	(1.976)	(.667)
α_1[c]	.828	.951
t-statistic ($\alpha_1 = 1$)[c]	(7.402)	(5.261)
Sum of squared forecast errors	10,390,107	26,715,171

[a] PP is projected price and AP is actual price. AP takes either the offering price or market price.
[b] P-value for testing the null hypothesis that correlation between PP and AP is equal to zero (two-tailed test).
[c] Coefficients from equation: $PP = \alpha_0 + \alpha_1 AP$; the model is supported if the hypotheses that $\alpha_0 = 0$ and $\alpha_1 = 1$ are accepted.

Two implications germane to this finding are: (1) Information in the issue prospectus has implications for the future growth and risk of the firm, and (2) The estimated models are indifferent to time and industry membership. They could be

applied to a variety of industries and over time. The findings reported in the current study support those of Klein (1996) and Kim et al. (1995a). Thus, the proposition that accounting information is value relevant in the pricing of IPO is also verified in the Indonesian IPO market.

5.9 Chapter Summary

This Chapter has provided the empirical findings of the study. The first section described the general profile of the sample and the descriptive statistics for continuous variables partitioned on the basis of industry classification and year of offering. The evidence suggests that Indonesian IPOs are, on average, underpriced by as much as 9.47%. The extent of IPO underpricing is insensitive to the measures used to calculate the initial returns. There appears to be no evidence that industry membership (subject to initial sample selection), and differences in time to listing, are related to the level of initial returns.

The second section provided the preliminary results of the analysis of the relationship between initial returns and the variables that previous studies suggest may have an influence. The results suggest that IPO initial returns are related to accounting risk proxies. In particular, IPO firms with a higher level of financial leverage tend to be more underpriced than their counterparts with lower levels of financial leverage. The univariate tests, as outlined in Section 3, provided further support that financial leverage is significantly related to initial returns.

The fourth section contained the results of the multivariate analyses. The section also provided tests of the hypotheses. Three accounting risk measures were found to be significant for the full sample: financial leverage, issue size, and growth. While the coefficients of financial leverage and issue size are in the expected

directions, firm growth is negatively related to initial returns. Operating leverage is negatively related to initial returns, which is in contrast to predictions. The negative coefficient of operating leverage is predominantly caused by the effect of financial leverage, where there tends to be an adverse relationship on the firm's risk between financial and operating leverages. Profitability appears to be moderately related to initial returns. Among five control variables, only the level of ownership retention, and the state of the market, are significantly related to initial returns. The coefficients of the other three control variables are in the expected direction, but none are significant.

The multicollinearity diagnoses provided in Section 5 suggest that collinearity among independent variables is present. While the presence of multicollinearity does not affect the significance level of the coefficients, it does affect the ability to draw inferences. The sensitivity analysis contained in Section 6 has provided evidence that variable measurements have affected the significance level of some variables. For example, the underwriter quality variable became significant in some regressions when different measures were used. The exclusion of the firm with an extreme value of OL1 also affected some of the regression results. However, given that the differences between variable measurements are moderate, the results obtained in the multivariate analyses are relatively unaffected.

The seventh section contained discussions of the results. This section discussed the finding of a negative relationship between operating leverage and initial return as a proxy for total firm risk. As empirically shown by Mandelker and Rhee (1984), operating and financial leverages tend to be negatively related because the firm's decision on operating leverage can be offset by the decision on financial

leverage. The section also showed that the market base measure of financial leverage tends to capture better the risk inherent to the firm.

Additional analyses, which comprise two tests: (1) Tests of the model on two states of the market, and (2) Tests on the pricing of IPOs, were provided in Section 8. The results of the tests on the effect of the state of the market on the explanatory of variables suggested that the model performed better during bullish periods. In the bearish periods, the signalling variables (not the accounting risk measures) explained most of the variation of initial returns. The test of the pricing of IPOs yielded the conclusion that accounting variables available in the issue prospectus are value relevant to the IPO. Thus, the IPO price level is a function of its accounting variables.

In summary, the answer to the primary research question "Is there an association between accounting variables perceived to be a measure of total firm risk and the magnitudes of the underpricing of new issues of common stocks?" was found to be "yes". This is indicated by the finding of a significant relationship between some of the accounting risk measures and the initial returns of the IPOs in some regressions.

CHAPTER 6

CONCLUSIONS, LIMITATIONS AND DIRECTION FOR FUTURE STUDY

6.1 Summary and Conclusions

It has been widely demonstrated that, on average, the initial public offerings of common stocks are underpriced. A number of theories have emerged to explain why such a phenomenon occurs. Amongst the existing theories, the one proposed by Rock (1986), and its extension by Beatty and Ritter (1986), has empirically been accepted as the one that best explains the phenomenon. The implication of this theory is that the extent of underpricing is related to ex ante uncertainty surrounding the issue. Empirical evidence has generally been in favour of this assertion.

This study argues that ex ante uncertainty is positively related to the firm's total risk, where total risk is defined as the risk inherent to the firm, comprising systematic and nonsystematic risk. A review of the literature suggests that accounting numbers are known as one of the potential proxies for total firm risk. Empirical evidence is generally in support of the assertion that accounting numbers could signal elements of the riskiness of a firm. Given the evidence that accounting numbers are of potential proxy for total risk, and also that total firm risk is positively related to the ex ante uncertainty of the firm making an IPO, this study argues that accounting numbers can also be a potential proxy for ex ante uncertainty. Thus, the specific purpose of this study is to extend existing studies by examining the factors, with the focus on accounting numbers, that determine the degree of underpricing. Moreover, it is expected that the evidence provided by this study would enhance our understanding of

the determinants of underpricing in general, and more specifically in an emerging capital market.

Five accounting risk proxies are examined: (1) financial leverage, (2) operating leverage, (3) firm size, (4) firm growth, and (5) profitability. Five control variables are also examined: (1) the quality of underwriter, (2) the level of ownership retention after the issue, (3) the firm's age, (4) the aftermarket standard deviation of return, and (5) the state of the market. Tests are performed on a sample of 149 Indonesian IPOs that went public during 1989-1997.

The findings of this study generally allow rejection of the null hypothesis that accounting risk measures are not related to the extent of underpricing. In particular, this study finds that financial leverage (measured as the ratio of total debt to total assets plus initial market value), firm size (measured as the size of the issue), and firm growth (measured as the growth of total assets) are highly related to the initial returns. Two other accounting risk proxies appear to have been marginally related to the extent of underpricing.

The study also finds that the model appears to explain better the relationship between accounting risk proxies and the degree of underpricing in situations where there are more firms making IPO, that is, during the bullish or hot periods. Application of the model in the bearish periods, suggests that it is the control variables that explain more of the variation of initial returns. Thus, it appears that fundamental information is more likely to be related to the initial return of Indonesian IPOs in periods of heavy IPOs.

Among the five control variables examined, the level of ownership retention, and the state of the market, are found to be consistently and significantly related to the extent of underpricing. The coefficients of these two variables are positive and are in

the expected direction. Although the direction of the other control variables meets the expectation, the lack of significance levels suggest any relationship with the degree of underpricing is unwarranted.

Additional analysis on the pricing of IPOs reveals that the model used by Klein (1996) explains more than three-quarters of the variation of the offer price and the aftermarket prices. Thus, the accounting variables are value relevant to the pricing of IPOs. The predictive ability of the market model is weaker than for the offering price model. Overall, the findings provide further support that accounting information is impounded in the pricing of an IPO. It obviously provides confirmation of anecdotal evidence advocated in the literature that accounting numbers are used as input into the pricing of IPOs (Perez, 1984; Bloch, 1986; Sutton & Bendetto, 1988; Buck, 1990).

6.2 Limitations and Possible Direction for Future Studies

There are some limitations identified in this study. The model used in this study is not developed through extensive derivation relating to accounting risk proxies and the extent of the IPO's initial return. Instead, it is based merely on suggestions made in literature coupled with empirical evidence. This study focuses its analysis on the role of accounting information in determining the initial return in IPO markets. It has been suggested that accounting information is not the only element in the total information system needed to assess the riskiness of a security. Accounting information does not have a monopoly in supplying information to the market (Dyckman & Morse, 1986). Thus, the selected accounting risk proxies examined in this study may not capture all of the effects of company risks. Specification error may also be present, and, thus, the exact contribution of each of the accounting risk proxies

is not warranted. Therefore, future studies may, firstly, examine the stationary and consistency of accounting ratios or accounting numbers in their relationship to systematic or total firm risk across industries, and if possible, rank them. This will enable us to develop a model that best explains the firm's risk determinants. Given that this has been achieved, the next step is to test the model and apply it in an IPO market. In addition, as noted by Anderson et al (1995) that the success in testing the underpricing equilibrium depends heavily on the success in selecting the proxies, it may be argued that the selected accounting risk proxies examined in this study may not represent all the possible risks relating to the issuing firm. Thus, another avenue for future study would be to test the model in other IPO settings, or the inclusion of other accounting risk measures.

The second limitation of the study is related to the characteristics of the market. An emerging market may exhibit different motives for the investors' valuation model and their investment decisions. That is, their justification on buy- sell decisions might not be driven by their extensive valuation methods, but instead, merely by illogical or intuitive reasoning. Yet, this notion might be incorrect, as most of the active market players in the Indonesian stock market are foreign investors who arguably use more knowledge-based analysis than intuition.

Moreover, one interesting feature of the Indonesian stock market is that foreign investors account for about three-quarters of the active market players despite their limited ownership of a maximum of 49% (this figure has been declining in the recent years, however). This feature provides a further research avenue, such as examining whether there is a significant difference between the level of foreign subscribers and the extent of underpricing. Also, as the ownership restriction was abolished in September 1997, one may examine the effects of this change on the level

of initial returns and make a comparison with periods where the restriction was still in place.

Other research avenues worth considering in the future are (1) the inclusion of other types of industries, such as finance and insurance companies, (2) the relation between the degree of underpricing and prospectus published in newspapers, (3) inclusion of firms with negative growth and the effect of the use of funds, and (4) examination on the impact of the requirement of the Indonesian capital market regulation that firms must have two years of profit.

Finally, as this study examines one of the emerging capital markets in the Southeast Asian region that has experienced a relatively high growth rate, future studies could also examine other capital markets in the region. This will enable us to make a judgment on the impact of the nature and the influence of institutional differences in explaining the underpricing phenomenon.

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Exhibit 1

List of Sample Firms

NO	NAME	CODE	LISTDATE	OFPRC	SHR (000)	GRO(000)
1	Jaya Pari Steel	33	04-Aug-89	7800	3360	26208000
2	Hero Supermarket	93	21-Aug-89	7200	1765	12708000
3	United Tractor	41	19-Sep-89	7250	2700	19575000
4	Java Comfeed	36	23-Oct-89	7200	4000	28800000
5	Great River Gar. Ind.	91	03-Nov-89	8700	4900	42630000
6	Berlina	35	06-Nov-89	7900	1750	13825000
7	Multipolar	97	06-Nov-89	10500	3428	35994000
8	Unggul Indah Corp.	34	06-Nov-89	17250	9000	155250000
9	Dankos Laboratories	53	13-Nov-89	6500	525	3412500
10	Astra Graphia	91	25-Nov-89	8550	3075	26291250
11	Indocement	31	05-Dec-89	10000	89832.15	898321500
12	Lippo Industries	42	05-Feb-90	8900	1250	11125000
13	Aqua Golden Miss.	51	01-Mar-90	7500	1000	7500000
14	Rimba Niaga Idola	92	05-Mar-90	3380	1200	4056000
15	United Sumatra	12	06-Mar-90	10700	11100	118770000
16	Aster Dharma Indus.	35	26-Mar-90	4500	2000	9000000
17	Berlian Laju Tanker	74	26-Mar-90	8500	2100	17850000
18	Tjiwi Kimia	38	03-Apr-90	9500	9300	88350000
19	Metrodata Epsindo	97	09-Apr-90	6800	1468	9982400
20	Sudarpo Corp.	97	07-May-90	5000	2600	13000000
21	Gajah Tunggal	42	08-May-90	5500	20000	110000000
22	Htl. Sahid Jaya	94	08-May-90	7000	11000	77000000
23	CP. Prima	36	14-May-90	4000	1000	4000000
24	Roda Vivatex	43	14-May-90	7500	1000	7500000
25	Petrosea	21	21-May-90	9500	4500	42750000
26	Tembaga M.S.	33	23-May-90	14100	3367	47474700
27	Lion Mesh P	33	04-Jun-90	7200	600	4320000
28	Hadtex Indosyn.	43	06-Jun-90	11750	7000	82250000
29	Schering Plough Ind.	53	08-Jun-90	12750	892.8	11383200
30	Tigaraksa Satriya	92	11-Jun-90	5750	2500	14375000
31	Cipendawa Farm	13	18-Jun-90	5900	3000	17700000
32	Inti Indorayon	38	18-Jun-90	9850	27200	267920000
33	Trias Sentosa	35	02-Jul-90	11800	3000	35400000
34	Ultrajaya Milk Indus.	51	02-Jul-90	7500	6000	45000000
35	Mayora Indah	51	04-Jul-90	9300	3000	27900000
36	Alumindo Perkasa	33	19-Jul-90	9800	1500	14700000
37	Prima Alloy	42	12-Jul-90	6750	2000	13500000
38	Indah Kiat Pulp Pap.	38	16-Jul-90	10600	60000	636000000
39	Dharmala/Tjilatjap PF	36	18-Jul-90	8500	5000	42500000
40	Intan Wijaya Chem.	34	27-Jul-90	8250	4000	33000000

Exhibit 1 (continued)

NO	NAME	CODE	LISTDATE	OFPRIC	SHR (000)	GRO(000)
41	PT. Indorama Synth.	34	03-Aug-90	12500	7000	87500000
42	PT. Duta Pertiwi Nus.	34	08-Aug-90	8100	3000	24300000
43	PT. Indospring	42	10-Aug-90	9000	3000	27000000
44	PT. Ekadharma Tape	34	14-Aug-90	6500	1000	6500000
45	PT. H.M. Sampurna	52	15-Aug-90	12600	27000	340200000
46	PT. Pan Brothers Tex	43	16-Aug-90	8700	3800	33060000
47	PT. Eratex Jaya	43	21-Aug-90	7550	6139.75	46355112.5
48	PT. Gudang Garam	52	27-Aug-90	10250	57807.8	592529950
49	PT. Branta Mulia	42	05-Sep-90	9250	12500	115625000
50	PT. Mayertex Indonesia	43	31-Oct-90	9900	1000	9900000
51	PT. Great Golden Star	43	03-Dec-90	8800	6000	52800000
52	PT. Itamaraya Gold	33	10-Dec-90	6950	4000	27800000
53	PT. Voksel Electric	45	20-Dec-90	6500	3080	20020000
54	PT. Argo Pantes	43	07-Jan-91	10000	15882	158820000
55	PT. IKI Kabel	45	21-Jan-91	4950	3500	17325000
56	PT. Polysindo Eka P	34	12-Mar-91	8900	12000	106800000
57	PT. Charoen Pokphand I.	36	18-Mar-91	5100	2500	12750000
58	PT. Kurnia Kapuas	34	01-Jul-91	5700	4500	25650000
59	PT. Semen Gresik	31	08-Jul-91	7000	40000	280000000
60	PT. Modern Photo	92	16-Jul-91	6800	4500	30600000
61	PT. Nippress	42	24-Jul-91	5000	4000	20000000
62	PT. Kalbe Farma	53	30-Jul-91	7800	10000	78000000
63	PT. Dynaplast	35	05-Aug-91	5600	2500	14000000
64	PT. Suba Indah	51	11-Dec-91	3700	3700	13690000
65	PT. Gunung Agung	93	06-Feb-92	5000	1000	5000000
66	PT. Kabelindo	45	01-Jun-92	6000	3100	18600000
67	PT. Kabel Metal	45	06-Jul-92	3500	10000	35000000
68	PT. Sona Topas	95	21-Jul-92	3750	1500	5625000
69	PT. Sorini Corporation	34	03-Aug-92	6000	3500	21000000
70	PT. Evershine	43	13-Oct-92	5400	4000	21600000
71	PT. Jembo Cable	45	18-Nov-92	4750	10000	47500000
72	PT. SMART Corp.	51	20-Nov-92	3000	30000	90000000
73	PT. Argha Karya PI	35	18-Dec-92	3800	16000	60800000
74	PT. Matahari Putra P	93	21-Dec-92	7150	8700	62205000
75	PT. Sekar Bumi	51	05-Jan-93	5000	7500	37500000
76	PT. Sarasa Nugraha	43	11-Jan-93	3500	5000	17500000
77	PT. Texmaco Perkasa E.	41	11-Mar-93	4800	1000	4800000
78	PT. Surabaya AIP	38	03-May-93	3500	20000	70000000
79	PT. Fast Food Indonesia	94	11-May-93	5700	4460	25422000
80	PT. Tira Austenite	91	27-Jul-93	3100	2000	6200000

Exhibit 1 (continued)

NO	NAME	CODE	LISTDATE	OFPRIC	SHR (000)	GRO(000)
81	PT. Ganda Wangsa	44	09-Aug-93	2350	10000	23500000
82	PT. Lion Metal Work	33	21-Aug-93	2150	3000	6450000
83	PT. Intraco Penta	91	23-Aug-93	3375	6000	20250000
84	PT. Sekar Laut	51	08-Sep-93	4300	6000	25800000
85	PT. Tancho Indonesia	54	30-Sep-93	7350	4400	32340000
86	PT. Andayani Megah	42	20-Oct-93	4250	20000	85000000
87	PT. Concord Benefit	43	27-Oct-93	2450	6300	15435000
88	PT. Kedaung Indah Can	33	28-Oct-93	2600	10000	26000000
89	PT. Indosepamas A.	44	15-Nov-93	3800	6000	22800000
90	PT. Anwar Sierad	36	22-Nov-93	4300	18000	77400000
91	PT. Super Mitory	44	20-Dec-93	2400	6800	16320000
92	PT. Multibreeder Adhi.	13	28-Feb-94	3600	10000	36000000
93	PT. TEXMACO Jaya	43	20-Mar-94	4125	20000	82500000
94	PT. Sumalindo Lestari J	37	21-Mar-94	9000	25000	225000000
95	PT. Putra Sejahtera P	94	25-May-94	5100	9000	45900000
96	PT. Super Indah Makmur	35	03-Jun-94	2075	5000	10375000
97	PT. Ades Alfindo PS	51	13-Jun-94	3850	15000	57750000
98	PT. Tempo Scan Pacific	53	17-Jun-94	8250	17500	144375000
99	PT. Ugahari	35	23-Jun-94	2975	5000	14875000
100	PT. Indofood Sukses M	51	14-Jul-94	6200	21000	130200000
101	PT. Wicaksana Overseas	92	08-Aug-94	3250	20000	65000000
102	PT. Steady Safe	74	08-Aug-94	3600	11650	41940000
103	PT. Bintang Kharisma	44	30-Aug-94	2800	10000	28000000
104	PT. Intinusa Selareksa	99	06-Sep-94	3000	5000	15000000
105	PT. Aneka Kimia Raya	91	03-Oct-94	4000	15000	60000000
106	PT. Medco Energy Corp.	22	12-Oct-94	4350	22000	95700000
107	PT. Langgeng Makmur PI	35	17-Oct-94	3000	18000	54000000
108	PT. Prasidha Aneka N	51	27-Oct-94	3000	30000	90000000
109	PT. Asiana Imi Industry	49	20-Oct-94	2900	10200	29580000
110	PT. Darya Varia Lab.	53	11-Nov-94	6200	10000	62000000
111	PT. Suparma	38	15-Nov-94	3500	26000	91000000
112	PT. Indal Aluminium I	33	05-Dec-94	3950	13200	52140000
113	PT. Keramika Indo. As.	32	08-Dec-94	2750	25000	68750000
114	PT. Centris Multi P	74	08-Dec-94	2450	20000	49000000
115	PT. Fajar Surya	38	19-Dec-94	3200	47000	150400000
116	PT. Karwell Indonesia	43	20-Dec-94	2900	20000	58000000
117	PT. Davomas Abadi	51	22-Dec-94	3300	17250	56925000
118	PT. Bukaka Teknik	75	09-Jan-95	3200	40000	128000000
119	PT. Budi Acid Jaya	34	08-May-95	3000	30000	90000000
120	PT. Tunas Ridean	91	16-May-95	2700	28000	75600000

Exhibit 1 (continued)

NO	NAME	CODE	LISTDATE	OFPRIC	SHR (000)	GRO(000)
121	PT. Mustika Ratu	54	27-Jul-95	2600	27000	70200000
122	PT. Surya Hidup Satwa	91	08-Aug-95	1125	20660	23242500
123	PT. Perdana Bangun P.	92	22-Aug-95	950	23000	21850000
124	PT. Miwon Indonesia	51	31-Oct-95	1950	25000	48750000
125	PT. Komatsu Indonesia	41	31-Oct-95	2100	32000	67200000
126	PT. Asahimas Flat Glass	32	08-Nov-95	2450	86000	210700000
127	PT. Citatah Marmer	24	27-Jun-96	2375	44000	104500000
128	PT. PP. London Sum Ind.	12	05-Jul-96	4650	38800	180420000
129	PT. Cahaya Kalbar	51	26-Jun-96	1100	34000	37400000
130	PT. Surya Dumai Ind.	37	27-Jul-96	1000	31000	31000000
131	PT. Ramayana Lestari S	93	15-Jul-96	3200	80000	256000000
132	PT. Fiskar Agung P.	51	25-Jul-96	1325	100000	132500000
133	PT. Kedawung Setia	55	29-Jul-96	800	50000	40000000
134	PT. Selamat Sempurna	42	09-Sep-96	1700	34400	58480000
135	PT. Pelangi Indah Can.	33	23-Sep-96	650	27500	17875000
136	PT. Daya Guna Samudra	14	24-Oct-96	1950	100000	195000000
137	PT. Siantar Top	51	16-Dec-96	2200	27000	59400000
138	PT. Sierad Produce	36	27-Dec-96	900	250000	225000000
139	PT. Alumindo Light MI	33	02-Jan-97	1300	92400	120120000
140	PT. Alter Abadi	29	09-Jan-97	900	88919	80027100
141	PT. Mitra Rajasa	74	30-Jan-97	1175	30000	35250000
142	PT. Daya Sakti Unggul	37	26-Mar-97	950	50000	47500000
143	PT. Inti Keramik Alamasri	32	04-Jun-97	750	100000	75000000
144	PT. Asia Intiselera	51	12-Jun-97	950	45000	42750000
145	PT. Lautan Luas	91	21-Jul-97	2950	50000	147500000
146	PT. Panasia Filament	43	22-Jul-97	650	50000	32500000
147	PT. Jakarta Kyoei Steel	33	06-Aug-97	650	50000	32500000
148	PT. Sunsoon Textile Man.	43	21-Aug-97	850	80000	68000000
149	PT. Aneka Tambang	23	27-Nov-97	1400	430769	603076600

Note

11-19 for agriculture, 21-29 for mining, 31-39 for basic industry and chemical, 41-49 for miscellaneous industry, 51-59 for consumer goods industry, 71-79 for infrastructure, utility, and transportation, and 91-99 for trade and services.

Offering price and gross proceeds are expressed in Rupiah.

PT stands for Perseroan Terbatas (Property Limited or Pty. Ltd.).

Exhibit 2

List of Underwriters and Their Frequency of Underwriting Services

No.	Name of Underwriter	Frequency	No.	Name of Underwriter	Frequency
1	Danareksa Securities	64	36	Sinarmas Securities	3
2	MERINCORP	50	37	SUN HUNG KAI Securities	3
3	BAPINDO Securities	39	38	Deemte Arthadana Securities	2
4	ASEAM Indonesia	36	39	SEAB	2
5	INDOVEST	35	40	Gadjah Tunggal	2
6	MULTICOLAR	32	41	DBS Securities	2
7	FICORINVEST	26	42	Standard Chartered Sec.	2
8	Jardine Fleming	24	43	DAIWA Indonesia Securities	2
9	MIFC	23	44	Aspoya Indonesia Securities	2
10	Inter Pacific Securities	20	45	Mashill Jaya Securities	2
11	IFI	17	46	Deutche Bank Securities	2
12	Pentasena Arthasentosa	17	47	ADS	2
13	MAKINDO	16	48	Card Danareksa Sec. Ind.	1
14	LIPPO Securities	15	49	ASIA Surya	1
15	NOMURA Indonesia	15	50	OLBC Sikap Securities	1
16	FINCONESIA	13	51	HG Asia Indonesia	1
17	PANIN Securities	11	52	HSBC Securities Indonesia	1
18	Trimegah Securindo	11	53	ASPAC Uppindo Securities	1
19	WI CARR Indonesia	11	54	Jade Securities	1
20	Buanamas Investindo	9	55	Citicorp	1
21	Bahana Securities	8	56	Niki Securities	1
22	Wardley James Capital Indo.	8	57	Asian Development Securities	1
23	Usaha Bersama Securities	7	58	Pratama Panaganarta	1
24	NIAGA Securities	6	59	Bali Capitalindo	1
25	PDFCI Securities	6	60	Rekaprima	1
26	Sigma Batara	6	61	BNI Securities	1
27	Bhakti Investama	5	62	Pacific Duaribu Securities	1
28	Credit Lyoness	5	63	BDNI Securities	1
29	Morgan Granfell Asia	5	64	Dongsuh	1
30	Peregrine Sewu	5	65	Benura Securities	1
31	Uppindo Securities	4	66	ING Baring Securities	1
32	Danamon Securities	4	67	Interasia Securities	1
33	Multinas	3	68	BNP Securities	1
34	Baring Securities Indonesia	3	69	SBC Warberg Indoensia	1
35	NIKKO Securities	3	70	BDNI Securities	1

Note.
The frequency of underwriting services shown in the Table is based on the frequency of acting as lead underwriter either independently or jointly. By 1997 the number of registered underwriters stood at 88.

Appendix 1.

Average and Standard Deviation of Adjusted Initial Return Partitioned on the Basis of Median Value for Continuous Variables and on the Basis of the Value Assigned to the Variables for Dichotomous Variables.

FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue, GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Ex ante uncertainty, and consequently underpricing, is predicted to increase with financial leverage (FL), operating leverage (OL), growth (GRO), ownership retention level (OWN), standard deviation of return (SDR), and market condition (MC), and decrease with firm size (SIZE), profitability (PRO), underwriter quality (UWQ), and IPO age (LAGE).

Variable[α]	Partition	# Firm	Mean UP	σUP	t-value[β] (F-value)[φ]
		Panel A: Financial Leverage (%)			
FL1	≤ 39.60	75	4.82	9.84	3.472[a]
	> 39.60	74	14.23	21.20	(4.641[a])
FL2	≤ 66.17	75	7.34	13.55	1.554[d]
	> 66.17	74	11.68	19.92	(2.161[a])
FL3	≤ 200.00	75	7.41	13.69	1.503[d]
	> 200.00	74	11.61	19.84	(2.100[a])
		Panel B: Operating Leverage (%)			
OL1	≤ 115.71	75	13.59	20.27	3.037[b]
	> 115.71	74	5.34	11.89	(2.902[a])
OL2	≤ 34.38	75	12.49	20.15	3.037[b]
	> 34.38	74	6.46	12.75	(2.329[a])
		Panel C: Firm Size (Natural Logarithm)			
SIZE1	≤ 24.8009	75	9.10	13.35	0.283
	> 24.8009	74	9.89	20.29	(2.309[a])
SIZE2	≤ 24.4121	75	13.38	20.60	2.872[b]
	> 24.4121	74	5.55	4.25	(3.239[a])
		Panel D: Firm Growth (%)			
GRO1	≤ 31.38	75	8.79	14.48	0.500
	> 31.38	74	10.20	19.47	(1.807[b])

Appendix 1 (continued)

GRO2	≤ 33.53	75	11.25	21.67	1.272
	> 33.53	74	7.71	10.50	(4.254[a])
	Panel E: Firm Profitability (%)				
PRO1	≤ 15.95	75	11.48	19.59	1.435[d]
	> 15.95	74	7.48	13.98	(1.966[b])
PRO2	≤ 7.80	75	12.15	19.94	1.932[c]
	> 7.80	74	6.80	13.22	(2.274[a])
PRO3	≤ 6.26	75	10.75	19.73	0.905
	> 6.26	74	8.22	13.96	(1.997[b])
	Panel F: The Quality of Underwriter				
UWQ	0	32	10.24	15.13	0.305
	1	117	8.77	17.65	(1.362)
	Panel G: The Level of Retained Ownership (%)				
OWN	≤ 76.90	75	7.50	13.29	-1.433[d]
	> 76.90	74	11.51	20.13	(2.293[a])
	Panel H: Age (Operating History) (year)				
AGE	≤ 16.00	73	10.24	12.91	0.527
	> 16.00	76	8.77	20.39	(2.496[a])
	Panel I: The Standard Deviation of Aftermarket Returns (%)				
SDR	≤ 2.21	75	8.29	10.79	0.859
	> 2.21	74	10.68	21.01	(3.875[a])
	Panel J: Market Condition (the State of the Market)				
MC	0	53	5.77	10.80	2.329[c]
	1	96	11.55	19.48	(3.254[a])
	Panel K: Offering Price and Number of Shares				
PRICE	≤ 4,750.00	75	9.37	15.57	0.091
	> 4,750.00	74	9.62	18.62	(1.431[d])
# of Shares	≤ 9,300,000	73	13.14	20.37	2.850[b]
	> 9,300,000	76	5.99	12.37	(2.709[a])

[a, b, c, d] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

[β] t-test values for differences in average of raw initial return between high and low ex ante uncertainty subsamples. The subsamples are formed on the basis of the selected proxies for ex ante uncertainty.

[φ] F-test values for differences in variance of raw initial return between high and low ex ante uncertainty subsamples. The subsamples are formed on the basis of the selected proxies for ex ante uncertainty.

Appendix 2

Simple Regression of Adjusted Initial Returns on Explanatory Variables (n=149) [φ]

The adjusted initial return is measured as the difference between the first day closing price and the offer price divided by the offer price and adjusted for market return on the corresponding period. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue, GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Standard errors (in parentheses) are from ordinary least squares regression.

	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC
Coef.	.3245	.1509	.0194	-.0091	-.0851	.0075	-.0426	-.0183	-.0369	-.1727	-.2809	-.0545	.0096	.3437	-.0255	.3110	.0577
(SE)	(.0852)	(.0831)	(.0082)	(.0075)	(.0707)	(.0127)	(.0123)	(.0289)	(.0242)	(.1371)	(.1788)	(.2895)	(.0342)	(.1570)	(.0256)	(.6671)	(.0289)
t	3.811[a]	1.815[d]	2.369[c]	-1.209	-1.203	.591	-3.453[a]	-.632	-1.524	-1.254	-1.571	-.188	.279	2.189[c]	-.993	.466	1.994[c]
Cons.	-.0351	-.0008	.0489	.1094	.1254	-.0914	.1358	.1025	.1137	.1253	.1219	.0987	.0874	-.1618	.1624	.0861	.0577
(SE)	(.0367)	(.0545)	(.0230)	(.0184)	(.0289)	(.3158)	(.3018)	(.0184)	(.0186)	(.0279)	(.0221)	(.0246)	(.0303)	(.1209)	(.0695)	(.0235)	(.0233)
t	-.958	-.014	2.051[c]	5.943[a]	4.334[a]	-.289	3.764[a]	5.558[a]	6.116[a]	4.495[a]	5.510[a]	4.021[a]	2.884[b]	-1.389	2.341[c]	3.660[a]	2.482[c]
R^2	8.99	2.19	3.68	.98	.97	.24	7.50	.27	1.56	1.07	1.65	.00	.00	3.16	.67	.15	2.63
F-stat.	14.523[a]	3.296[d]	5.615[a]	1.462	1.446	.348	11.920[a]	.399	2.324	1.586	2.467	.035	.078	4.792[c]	.986	.217	3.977[c]
Expected Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)	(+)

[a, b, c, d,] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

[φ] The adjusted initial return is measured as follows: $MAUP_j = [(P_{j,t} - P_{j,off}) / P_{j,off}] - [(MR_{jt} - MR_{j,t-1}) / MR_{j,t-1}]$, where P_{jt} is the first day closing price of security j, $P_{j,off}$ is the offering price of security j, MR_{jt} is market return on the day of the issue of security j, $MR_{j,t-1}$ is market return on the day before the issue of security j.

Appendix 3

Simple Regression of Average First Week Initial Returns on Explanatory Variables (n=149)[φ]

The average first week return is measured as the difference between the average of the first five days closing prices and the offer price divided by the offer price. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Standard errors (in parentheses) are from ordinary least squares regression.

	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC
Coef.	.3641	.1871	.0239	-.0114	-.1046	-.0010	-.0562	-.0206	-.0353	-.2455	-.3216	-.0272	.0189	.3595	-.0261	.4705	.0555
(SE)	(.0869)	(.0852)	(.0084)	(.0077)	(.0728)	(.0131)	(.0124)	(.0299)	(.0249)	(.1406)	(.1839)	(.2983)	(.0352)	(.1617)	(.0264)	(.6869)	(.0294)
t	4.187[a]	2.195[c]	2.850[b]	-1.476	-1.437	-.076	-4.536[a]	-.694	-1.413	-1.746[d]	-1.749[d]	-.091	.536	2.223[c]	.685	.685	1.855[d]
Cons.	-.1066	-.0228	.0392	.1140	.1333	.1207	.1468	.1044	.1138	.1390	.1268	.0978	.0810	-.1793	.1649	.0825	.6601
(SE)	(.0374)	(.0559)	(.0243)	(.0189)	(.0298)	(.3258)	(.3028)	(.0189)	(.0192)	(.0286)	(.0228)	(.0253)	(.0312)	(.1246)	(.0715)	(.0242)	(.0240)
t	-1.337	-.408	1.611	6.025[a]	4.486[a]	.370	4.849[a]	5.497[a]	5.935[a]	4.864[a]	5.570[a]	3.863[a]	2.595[b]	-1.439	2.308[c]	3.407[a]	2.013[c]
R^2	10.66	3.18	5.24	1.46	1.39	.00	12.281	.33	1.34	2.03	2.04	.00	.20	3.25	.66	.32	2.29
F-stat.	17.532[a]	4.820[c]	8.124[b]	2.180	2.066	.006	20.581[a]	.482	1.997	3.049[d]	3.057[d]	.008	.287	4.941[c]	.975	.469	3.442[d]
Expected Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)	(+)

[a, b, c, d,] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

[φ] The average first week initial return is measured as follows: $UPA5D_j = (P_{j,v} - P_{j,off}) / P_{j,off}$, where $P_{j,v}$ is the average of the first five day price after the issue of security j and $P_{j,off}$ is the offering price of security j.

Appendix 4

Multivariate Tests of Adjusted Initial Return on Continuous Variable (n=149)

The adjusted initial return is measured as the difference between the first day closing price and the offer price divided by the offer price and adjusted for market return on the corresponding period. FL1 is measured as total debt / (total assets + initial market value of equity); FL2 is measured as total debt / total assets; FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; OL2 is measured as the ratio of fixed assets to total assets; SIZE1 is the natural logarithm of sales for the last fiscal year; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO1 is measured as $(sales_t - sales_{t-1}) / sales_{t-1}$; GRO2 is measured as $(total\ assets_t - total\ assets_{t-1}) / total\ assets_{t-1}$; PRO1 is the ratio of operating profit to sales; PRO2 is the ratio of net income after tax to sales; PRO3 is the ratio of net income after tax to total assets; UW is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Standard errors (in parentheses) are adjusted for White's (1980) heteroscedasticity consistent covariance matrix.

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC	Const.	R^2 (F)
1	.3211			-.0099		-.0048		-.0073		.0558			-.0282	.1464	-.0113	.1423	.0605	-.0087	7.92
	(.1176)			(.0050)		(.0045)		(.0183)		(.0924)			(.0324)	(.1211)	(.0192)	(.8865)	(.0251)	(.0692)	(2.282)[c]
	2.731[b]			-1.997[c]		-1.064		-.402		.605			-.872	1.209	-.589	.161	2.417[c]	-.126	
2	.2909			-.0077			-.0132		-.0325		.1092		-.0303	.2446	.0049	-.0398	.0603	.1040	10.58
	(.1109)			(.0041)			(.0064)		(.0169)		(.1162)		(.0315)	(.1403)	(.0200)	(.8608)	(.0243)	(.0992)	(2.762)[b]
	2.624[b]			-1.876[d]			-2.051[c]		-1.918[d]		.939		-.961	1.743[d]	.243	-.046	2.485[c]	1.048	
3	.3721			-.0068		-.0073			-.0286			.4212	-.0291	.1545	-.0026	-.0347	.0597	-.0035	10.01
	(.1209)			(.0032)		(.0047)			(.0164)			(.2241)	(.0314)	(.1234)	(.0197)	(.877)	(.0239)	(.0671)	(2.657)[b]
	3.077[b]			-2.131[c]		-1.564			-1.743[d]			1.879[d]	-.929	1.251	-.134	-.039	2.492[c]	-.052	
4	.2847				-.0027		-.0135	-.0037		.0289			-.0254	.2322	.0011	.1778	.0607	.1027	8.82
	(.1118)				(.0777)		(.0063)	(.0176)		(.1116)			(.0314)	(.1337)	(.0197)	(.9201)	(.0251)	(.0984)	(2.442)[b]
	2.546[c]				-.035		-2.159[c]	-.208		.259			-.809	1.737[d]	.054	.193	2.416[c]	1.043	
5	.2981				-.0294	-.0049			-.0309		-.0047		-.0233	.1827	-.0105	.1311	.0524	-.0087	8.08
	(.1151)				(.0739)	(.0047)			(.0173)		(.1221)		(.0314)	(.1306)	(.0189)	(.9151)	(.0236)	(.0663)	(2.309)[c]
	2.590[c]				-.397	-1.040			-1.789[d]		-.038		-.745	1.399	-.556	.143	2.225[c]	-.131	
6	.3382				-.0058		-.0146		-.0299			.4699	-.0277	.209	.0082	-.0398	.0609	.0921	11.51
	(.1110)				(.0619)		(.0059)		(.0164)			(.2309)	(.0305)	(.1328)	(.0197)	(.8898)	(.0244)	(.0918)	(2.937)[b]
	3.046[b]				-.094		-2.446[c]		-1.834[d]			2.035[c]	-.909	1.663[d]	.415	-.045	2.501[c]	1.003	

Appendix 4 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC	Const.	R^2 (F)
7		.0809		-.0079		-.0016		-.0134		-.0431			-.0260	.2717	-.0178	.2394	.0477	-.0684	1.27
		(.0672)		(.0044)		(.0052)		(.0179)		(.1068)			(.0311)	(.1378)	(.0202)	(.9343)	(.0244)	(.1055)	(1.192)
		1.205		-1.794[d]		-.309		-.747		-.404			-.836	1.971[d]	-.883	.256	1.957[d]	-.648	
8		.0657		-.0039			-.0163		-.0360		-.0489		-.0306	.4362	.0057	.0566	.0474	.1263	5.69
		(.0697)		(.0039)			(.0072)		(.0172)		(.1412)		(.0304)	(.1716)	(.0213)	(.8940)	(.0238)	(.1155)	(1.899)[c]
		.942		-1.021			-2.270[c]		-2.090[c]		-.559		-1.007	2.542[c]	.267	.063	1.991[c]	1.093	
9		.0750		-.0088		-.0031			-.0342			-.0150	-.0281	.3132	-.0138	.0922	.0460	-.0562	2.38
		(.0621)		(.0040)		(.0051)			(.0177)			(.2328)	(.0306)	(.1455)	(.0205)	(.9258)	(.0235)	(.0959)	(1.363)
		1.209		-2.181[c]		-.607			-1.932[d]			-.064	-.919	2.152[c]	-.671	.099	1.956[d]	-.586	
10		.0999			-.0005		-.0169	-.0078		-.0156			-.0286	.3946	.0029	.2385	.0486	.1245	3.82
		(.0679)			(.0794)		(.0069)	(.0166)		(.1145)			(.0302)	(.1577)	(.0202)	(.9504)	(.0245)	(.1140)	(1.592)
		1.471			-.006		-2.429[c]	-.469		-.136			-.949	2.503[c]	.142	.251	1.982[c]	1.092	
11		.0285			-.0305	-.0019			-.0339		-.2066		-.0216	.3347	-.0168	.2097	.0424	-.0548	2.54
		(.0725)			(.0756)	(.0053)			(.0175)		(.1282)		(.0297)	(.1502)	(.0202)	(.9582)	(.0234)	(.0934)	(1.389)
		.393			-.403	-.366			-1.944[d]		-1.611		-.729	2.229[c]	-.835	.219	1.813[d]	-.587	
12		.1053			-.0093		-.0182		-.0357			.1607	-.0308	.4254	.0077	.0683	.0456	.1300	5.48
		(.0611)			(.0664)		(.0068)		(.0175)			(.2254)	(.0299)	(.1632)	(.0205)	(.9271)	(.0236)	(.1183)	(1.864)[d]
		1.724[d]			-.140		-2.685[b]		-2.037[c]			.713	-1.030	2.606[b]	.374	.074	1.934[d]	1.099	

Appendix 4 (continued)

Reg.	FL1	FL2	FL3	OL1	OL2	SIZE1	SIZE2	GRO1	GRO2	PRO1	PRO2	PRO3	UWQ	OWN	LAGE	SDR	MC	Const.	R^2 (F)
13			.0131	-.0078		.0001		-.0101		-.0286			-.0267	.2449	-.0191	.1371	.0464	-.0659	2.21
			(.0062)	(.0045)		(.0051)		(.0185)		(.1031)			(.0311)	(.1402)	(.0200)	(.9217)	(.0243)	(.1038)	(1.337)
			2.113[c]	-1.748[d]		.016		-.548		-.278			-.857	1.747[d]	-.955	.149	1.913[d]	-.635	
14			.0094	-.0041			-.0151		-.0351		-.0704		-.0304	.4228	.0047	-.0062	.0463	.1298	6.07
			(.0066)	(.0039)			(.0074)		(.0177)		(.1464)		(.0303)	(.1770)	(.0212)	(.0896)	(.0239)	(.1179)	(1.963)[c]
			1.418	-1.034			-2.050[c]		-1.989[c]		-.481		-1.002	2.389[c]	.223	-.007	1.934[d]	1.101	
15			.0133	-.0080		-.0015			-.0318			.0632	-.0286	.2809	-.0148	-.0066	.0443	-.0569	3.30
			(.0064)	(.0040)		(.0051)			(.0182)			(.2448)	(.0305)	(.1505)	(.0204)	(.9193)	(.0234)	(.0954)	(1.508)
			2.073[c]	-1.991[c]		-.287			-1.747[d]			.258	-.938	1.867[d]	-.726	-.007	1.888[d]	-.597	
16			.0121		.0022		-.0153	-.0049		-.0237			-.0275	.3847	.0022	.1502	.0482	.1294	4.24
			(.0060)		(.0794)		(.0069)	(.0169)		(.1099)			(.0300)	(.1628)	(.0199)	(.9462)	(.0244)	(.1176)	(1.659)[d]
			2.013[c]		.028		-2.184[c]	-.293		-.216			-.917	2.363[c]	.112	.159	1.977[c]	1.101	
17			.0095		-.0288	-.0010			-.0319		-.1586		-.0235	.3010	-.0178	.1380	.0402	-.0549	3.18
			(.0069)		(.0751)	(.0053)			(.0179)		(.1255)		(.0298)	(.1542)	(.0199)	(.9551)	(.0231)	(.0927)	(1.490)
			1.373		-.383	-.189			-1.780[d]		-1.264		-.786	1.952[d]	-.895	.145	1.744[d]	-.592	
18			.0130		-.0087		-.0165		-.0348			.1972	-.0295	.4134	.0067	-.0201	.0448	.1354	5.92
			(.0063)		(.0669)		(.0069)		(.0181)			(.2381)	(.0296)	(.1700)	(.0204)	(.0933)	(.0235)	(.1220)	(1.938)[c]
			2.063[d]		-.130		-2.379[c]		-1.921[d]			.786	-.997	2.432[c]	.331	-.216	1.908[d]	1.110	
Exp. Sign	(-)	(-)	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)	(-)	(-)	(+)	(-)	(+)	(+)		

[a, b, c, d,] denote coefficient as being significantly different from zero at the 0.001, 0.01, 0.05, and 0.10 levels, respectively.

Appendix 5

Collinearity Diagnoses Using the Condition Indices and the Decomposition of Coefficient Variance Matrix (Regression 11 of Table 5.12)*

FL3 is measured as long term debt / total assets; OL1 is measured as the ratio of total assets to sales; SIZE2 is the natural logarithm of gross proceeds of the issue; GRO2 is measured as (total $assets_t$ – total $assets_{t-1}$) / total $assets_{t-1}$; PRO2 is the ratio of net income after tax to sales; UWQ is the measure of underwriter quality and takes a value of one for high quality underwriter and zero otherwise; OWN is the retained ownership level and is measured as the portion of shares held by the issuer after the issue; LAGE is the natural logarithm of years in operation, SDR is the standard deviation of the first ten days return, excluding the first day return; MC is market condition and takes a value of one for a firm making an IPO during a bullish market and zero otherwise. FL is financial leverage; OL is operating leverage; GRO is firm growth; PRO is profitability, UWQ is underwriter quality, OWN is ownership retention, SDR is standard deviation of returns, and MC is market condition. Values that are boldfaced indicate the possible presence of multicollinearity. The condition index above 30 is indicative of the presence of multicollinearity and the variance of coefficient above .90 in at least two variables on the same row is indicative of the presence of multicollinearity.

Row	Condition Index	Intercept	Proportion of Variance of Coefficient									
			FL3	OL1	SIZE2	GRO2	PRO2	UWQ	OWN	LAGE	SDR	MC
1	1.000	0.000	0.002	0.002	0.000	0.003	0.003	0.004	0.000	0.000	0.003	0.003
2	3.650	0.000	0.052	0.009	0.000	0.441	0.023	0.059	0.000	0.000	0.022	0.052
3	3.919	0.000	0.023	0.027	0.000	0.264	0.094	0.203	0.000	0.000	0.055	0.018
4	4.588	0.000	0.152	0.003	0.000	0.043	0.149	0.325	0.000	0.001	0.102	0.036
5	5.015	0.000	0.025	0.004	0.000	0.008	0.007	0.308	0.000	0.000	0.407	0.236
6	5.454	0.000	0.072	0.139	0.000	0.105	0.022	0.054	0.001	0.001	0.304	0.317
7	6.536	0.000	0.185	0.370	0.000	0.000	0.435	0.011	0.000	0.000	0.008	0.205
8	8.204	0.001	0.392	0.281	0.001	0.108	0.208	0.005	0.005	0.069	0.014	0.050
9	17.363	0.003	0.071	0.077	0.003	0.007	0.051	0.002	0.119	0.700	0.026	0.040
10	**34.299**	0.032	0.021	0.047	0.060	0.008	0.000	0.022	0.807	0.217	0.001	0.028
11	**105.448**	**0.964**	0.006	0.042	**0.936**	0.013	0.009	0.008	0.068	0.011	0.058	0.017

* Details of the process of detecting multicollinearity can be found in Hair et al. (1995, pp. 152-154).